



CAPITAL STRATEGIES
PHYSICAL AND ENVIRONMENTAL PLANNING
300 A & E BUILDING
BERKELEY, CALIFORNIA 94720-1382

May 2019

FINAL SUPPLEMENTAL EIR
TO THE 2020 LONG RANGE DEVELOPMENT PLAN
ENVIRONMENTAL IMPACT REPORT

Project Title: Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan

Lead Agency: The Regents of the University of California

Project Sponsor: University of California, Berkeley

Project Location: The approximately one-acre Project site for the Upper Hearst Development (Assessor's Parcel Number 58-2201-9-1) is located at the Upper Hearst and Ridge parking lots on the northwest corner of La Loma Avenue and Hearst Avenue in the City of Berkeley. The site is bounded to the north by Ridge Road and the Cloyne Court Student Cooperative; to the east by La Loma Avenue; to the south by Hearst Avenue; and to the west by the historic Beta Theta Pi house.

County: Alameda County, California

Program EIR: UC Berkeley 2020 Long Range Development Plan EIR, certified by The Regents January 2005, SCH #2003082131; as updated by LRDP Amendment #1 and Addendum #5 to address Climate Change.

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1. INTRODUCTION & SUMMARY

In accordance with the California Environmental Quality Act (CEQA) and Sections 15088, 15089, and 15132 of the CEQA Guidelines, the University of California, Berkeley has prepared the Final Supplemental Environmental Impact Report (Final SEIR) for the proposed Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan (2020 LRDP). Together, the Upper Hearst Development and amendment to the 2020 LRDP comprise the proposed Upper Hearst Development (the “Project”).

This document contains the comments and responses on the Draft Supplemental Environmental Impact Report (Draft SEIR) as well as additional changes to the text of the Final SEIR. These components, along with the attached Draft SEIR and Mitigation Monitoring and Reporting Program, comprise the Final SEIR as defined in State CEQA Guidelines Section 15132.

2. COMMENTS AND RESPONSES ON THE DRAFT SEIR

CEQA Guidelines Section 15088 requires that the lead agency evaluate public comments on environmental issues included in a Draft EIR (or Supplemental EIR) and prepare written responses to those comments that raise significant environmental issues. Pursuant to CEQA Guidelines Section 15088(b), “The written responses shall describe the disposition of significant environmental issues raised (e.g., revisions to the proposed project to mitigate anticipated impacts or objections). In particular, the major environmental issues raised when the lead agency’s position is at variance with recommendations and objections raised in the comments must be addressed in detail giving reasons why specific comments and suggestions were not accepted.” The CEQA Guidelines call for responses that contain a “good faith, reasoned analysis” with statements supported by factual information. CEQA Guidelines Section 15088 further states that the “level of detail contained in the response, however, may correspond to the level of detail provided in the comment (i.e., responses to general comments may be general). A general response may be appropriate when a comment does not contain or specifically refer to readily available information, or does not explain the relevance of evidence submitted with the comment.”

The public review period for the Draft SEIR for the proposed Project began on February 20, 2019, and closed on April 12, 2019. UC Berkeley received 174 comment letters on the Draft SEIR. As required by CEQA, UC Berkeley has prepared responses to each of these letters. Many comments are similar or address the same issue. For these comments, *thematic responses* have been developed. These are presented first and, when appropriate, responses to individual comments will reference the thematic response.

The comment letters that UC Berkeley received are listed below and attached to the Final SEIR document as Appendix A. UC Berkeley has marked up these comment letters by numbering each separate issue raised by the comment. To review the complete comments, please refer to Appendix A. In addition, Section 2 of the Final SEIR document includes a summary of each comment prior to issuing a response. Each comment letter has been organized by category – public agency (A), organization (ORG), or individual (IND) – and numbered sequentially in each category. The responses to each comment identify first the number of the comment letter and then the number assigned to each comment (Response A 2.1, for example, indicates that the response is for the first issue raised in the second letter from a public agency).

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UC Berkeley held two public hearings to take oral comments from interested parties on the Draft SEIR. The first was held at UC Berkeley on March 12, 2019, at 6:30 p.m., at the Alumni House. The second was held on March 21, 2019, at 6:30 p.m., at University Hall, Room 150, 2199 Addison Street, Berkeley. Responses to oral comments from these hearings follow the responses to the written comments received.

Minor changes and corrections to the Draft SEIR are made in response to certain comments below. Finally, other minor changes made to the Final SEIR that are not the result of public comments are shown at the end of this document.

THEMATIC RESPONSES

The following thematic responses address recurring themes in the comments received. Where these topics are raised by commenters, the reader is referred to these comprehensive responses on the appropriate issue area.

Thematic Response: Parking

A number of commenters expressed concern about the Upper Hearst Development's effect on parking availability, including the temporary elimination of parking on the Project site during construction and the long-term reduction in parking spaces (relative to existing conditions) in the rebuilt Upper Hearst parking garage, as well as temporary displacement of ADA spaces. Commenters variously suggested that the reduction in parking would make it harder for working parents, faculty, staff, and students at UC Berkeley to commute to and from campus, causing an adverse effect on their quality of life. Commenters also opined that the reduction in parking would affect recruitment and retention of UC Berkeley faculty and staff, and that it would result in drivers circling the campus looking for parking, which would have adverse impacts on the environment in terms of traffic, air quality, and other factors. In addition, commenters expressed concern about instability in the description of the Upper Hearst Development, with respect to the number of proposed parking spaces on-site.

Although parking supply and demand can be described within an EIR for informational purposes and is relevant to analysis of traffic impacts, a parking deficit in itself is not considered to be an environmental impact requiring mitigation under CEQA. See San Franciscans Upholding the Downtown Plan v. City and County of San Francisco, 102 Cal. App. 4th 656 (2002). Nevertheless, UC Berkeley has prepared the following response to help address the community's concerns and provide information on this topic to the public and The Regents.

The Draft SEIR acknowledges the Upper Hearst Development's long-term effect on parking availability. As discussed in Section 3, *Project Description*, of the Draft SEIR, the Project site currently provides 407 parking spaces, including 337 marked parking stalls and the capacity for 50 attendant or stacked parking spaces in the Upper Hearst parking structure, and 20 marked parking spaces in the adjacent Ridge surface parking lot. The Draft SEIR assumes that the Upper Hearst Development would reduce the total number of parking spaces on-site from 407 to approximately 200, including 175 marked parking spaces and 25 attendant parking spaces.

Since publication of the Draft SEIR, UC Berkeley has revised the parking capacity in the proposed Project. The Upper Hearst Development would likely include 171 marked parking spaces (with about 90 spaces reserved for building residents and about 80 spaces for UC Berkeley parking permit holders) and no attendant parking spaces, which would result in a net reduction of 174 marked parking spaces on the Project site, relative to existing conditions. To address the change in parking supply, the text of the SEIR has been revised to state that the Upper Hearst Development would provide up to 171 parking spaces on-site. This assumption provides for a more conservative environmental analysis from the standpoint of traffic and air quality impacts because additional parking spaces would result in more vehicle trips to and from the Project site.

Section 3, *Project Description*, has been amended as follows:

As a result of removing existing parking areas, it is assumed that the Upper Hearst Development would reduce the total number of parking spaces on-site from 407 to ~~approximately 200, including 175~~ 171 marked parking spaces ~~and 25 attendant parking spaces~~. One driveway from ~~La Loma~~ Upper Hearst Avenue would provide vehicular access to the parking garage.

In addition, Table 21 in Section 8, *Alternatives*, has been amended to show that the Upper Hearst Development would provide up to 171 parking spaces.

During construction of the Upper Hearst Development, which is estimated to last 23 months, parking would be unavailable on the Project site. As commenters assert, this would result in a local deficit in parking spaces that serve the northeastern quadrant of the Campus Park, including but not limited to academic buildings in the College of Engineering. Those currently using the parking spaces that would be removed as a result of the Project would either need to park in other locations, some of which may be more distant from their ultimate campus destination, or shift to another travel mode (e.g., AC Transit, BART, bicycling, walking, or ride-hailing services).

UC Berkeley offers numerous public transportation options including a shuttle system servicing the campus and vicinity; discounted carpool permits and transit passes; and expansive bicycle infrastructure. To partially offset the loss of parking spaces for UC Berkeley permit holders during construction, the UC Berkeley Parking & Transportation office has negotiated temporary access to a minimum of 150 spaces in the nearby garage beneath the Maxwell Family Field for campus C and F permit holders (i.e., the campus would cover the costs directly and there would be no additional fee for UC permit holders). These spaces in the Maxwell Family Field and Stadium garage would be additional to UC Berkeley's existing parking supply for C and F permit holders. The garage is about a five-minute walk to the Project site, which would not substantially lengthen commute times for people who currently use the Upper Hearst parking structure. UC Berkeley would reevaluate continuation of this offset after the Upper Hearst parking structure is rebuilt.

At the nearby Lower Hearst parking structure, as part of this project, of the 70 spaces currently designated for public parking, 50 spaces would be re-designated for "C" and "F" permit holders. The remaining 20 spaces would be held for public parking, which is primarily used by students who have classes only a few days a week. No "S" permit parking space would be affected by this project. UC Berkeley also plans to add a new shuttle route to provide access to the Foothill parking lot and to the Clark Kerr campus parking lots. Additionally, UC Berkeley is currently assessing options to improve pedestrian safety and access to the Foothill parking lot. Although the Clark Kerr campus parking may not be a desirable alternative for those currently parking in the Upper Hearst structure, the UC Berkeley Parking & Transportation office would work with other permit holders who work on the south side of the UC Berkeley campus and advertise that option to reduce demand for other parking spaces closer to the Upper Hearst parking structure. The Parking & Transportation office would also add real-time occupancy sensors in the Foothill lot like the ones already in the Clark Kerr campus. Sensors would allow those coming to campus to check the availability of parking in both the Foothill and Clark Kerr lots through an already working mobile app and learn which lot has open spaces before they get to the lot.

UC Berkeley anticipates that parking for construction workers would average about 40 workers a day. The contractor would notice workers that parking is limited and some workers may carpool or take public transportation to the project site. Forty parking spaces in the first floor of nearby Maxwell Family Field Stadium Garage would be reserved and made available as paid parking to construction workers for the duration of the project. Also, during construction, when the concrete podium is built separating the garage and residential floors, some temporary parking would be available on site. Construction workers could also park on public streets, but no contractor parking would be allowed in UC Berkeley parking lots other than the Maxwell Family Field and Stadium garage.

After approval of the Project and prior to the start of construction, the Parking & Transportation office would work with permit holders affected by demolition of the Upper Hearst parking structure to provide them with alternate parking options proximate to the campus. Other options, including additional shuttles, would also be considered. Following construction, the Parking & Transportation office would operate the rebuilt Upper Hearst parking structure. Additionally, during construction, while American with Disabilities (ADA) accessible parking spaces are not required because there would be no parking provided at all, accessible parking would be available in the Lower Hearst parking structure and there are also four ADA spaces adjacent to Bechtel Engineering Center across Hearst Avenue.

As noted above, a parking deficit is not considered an impact under CEQA; however, the secondary environmental impacts of reducing parking should be considered within the scope of an EIR. The reduction of parking spaces on the Project site would result in the displacement of some existing vehicles traveling to the site to parking facilities around the campus and its environs. As drivers displaced from parking on-site search for available parking elsewhere, a modest increase in vehicles circulating around the Northside of campus could occur, but not to the extent that would substantially increase emissions of criteria air pollutants, carbon monoxide, other greenhouse gasses or result in significant traffic impacts. Furthermore, the installation of real-time occupancy sensors at other campus parking facilities would enable drivers to check parking availability before arriving on campus, which would reduce circulation in search of additional parking.

Thematic Response: Environmental Analysis of the Updated Population Baseline

A number of commenters suggest that the updated population baseline related to the increase in enrollment beyond that projected in the 2020 LRDP EIR would have significant impacts in the City of Berkeley with regard to multiple environmental issues: traffic; “wet” utilities (water use and wastewater and stormwater generation; aesthetics; water quality; solid waste generation; air quality; noise; greenhouse gas emissions; and public services, including police, fire and emergency services/ambulances. Some commenters stated an opinion that the Draft SEIR only discussed impacts to the Campus Park related to these topics and not impacts off campus. In addition, commenters requested that UC Berkeley conduct a separate CEQA analysis of the updated population baseline, rather than couple this analysis with the Draft SEIR’s evaluation of the Upper Hearst Development.

Current and Projected Campus Headcount

As stated in Draft SEIR Section 4, *Relationship to 2020 LRDP*, the 2020 LRDP Final EIR’s population numbers were based on actual headcount for students, employees (faculty and staff), and other visitors and vendors. Table 3.1-1 in the 2020 LRDP Final EIR indicated a student headcount of 31,800 and total regular-term campus headcount of 45,940 for academic year 2001-2002, and projected an academic year 2020 student headcount of 33,450 and total regular-term campus headcount of 51,260. As discussed in Section 3.1.5 of the 2020 LRDP Final EIR, it was anticipated that the student enrollment would level off and stabilize at 33,450 by the year 2010.

As of the publication of the Notice of Preparation for the GSPP SEIR in August 2018, UC Berkeley’s student enrollment was 40,955 and the total campus headcount was 57,637, both of which exceed the projections described and analyzed in the 2020 LRDP Final EIR. The 2017-18 year student enrollment of 40,955 exceeds the 2020 LRDP projection by approximately 7,500 students. Employee numbers are slightly below the 2020 LRDP projections.

Population growth, in and of itself, is not an environmental impact. However, population growth may contribute to an increase in impacts in other topical areas. The population projections provided in the 2020 LRDP were solely for the purpose of conducting the impact analyses in the 2020 LRDP Final EIR. It is expected that the academic component of the proposed Upper Hearst Development would house approximately five net new employees and 30 additional students when construction is completed for the academic year 2022-2023. The residential component would include up to 225 beds. Because the 2020 LRDP Final EIR estimated campus headcount only through 2020 and because the campus headcount projected for 2020 has already been exceeded, the information in the 2020 LRDP Final EIR has become outdated. Therefore, a new baseline is being established for 2018, as well as new future projections to the academic year 2022-2023, the year that the Upper Hearst Development would be completed and occupied by the additional staff and students.

It is expected that UC Berkeley would accommodate the additional headcount without leading to physical development that exceeds the 2020 LRDP EIR's projected growth in student beds and building square footage. Despite the growth in campus headcount over 2020 LRDP projections, which has led to the new campus headcount baseline, the analysis in the GSPP SEIR shows that the campus is still operating within the envelope of capacities and demands for resources such as housing, water, electricity, public services, and others that were analyzed in the 2020 LRDP Final EIR. At the end of 2018, approximately 955,160 gross square feet (gsf) of new 2020 LRDP developed space had been constructed or was under construction on the campus out of the 2.2 million gsf of development projected in the 2020 LRDP and analyzed in the 2020 LRDP Final EIR for year 2020. This is only 43 percent of the projected development total. Similarly, 1,119 student beds out of the 2,600 beds projected to be built in the 2020 LRDP had been constructed. The lack of new or more severe significant impacts associated with the increase in campus headcount can be attributed to the implementation of various UC policies contributing to a "greener campus" and to shifts in transportation behaviors moving away from single vehicle occupancy trips, among others.

Project's Effects on Population Growth in the City of Berkeley

As discussed in Item 12, Population and Setting, in Draft SEIR Section 6, *Environmental Evaluation*, as of January 2018, the City of Berkeley has a population of 121,874 (California Department of Finance 2018), which includes students living in the city and on the UC Berkeley campus. The current citywide population already exceeds the City of Berkeley General Plan EIR's population forecast of 116,359 for the year 2020. The additional campus headcount would contribute to this existing exceedance of the General Plan EIR's 2020 population forecast. However, this analysis is conservative because it assumes that all additional UC Berkeley students under the increased headcount would be new Berkeley residents. In reality, any students already residing in Berkeley would not increase the City's population and, based on the most current information available, approximately 65 percent of UC Berkeley students reside on campus or within 1 mile of campus. See UC Undergraduate Experience Survey: Results and Summary, Background 5 (2018), <https://pages.github.berkeley.edu/OPA/surveys/ucues2018.html>.

As indicated at page 151 of the Draft SEIR, additional student enrollment could indirectly result in an increase in student rentals of private off-campus housing in Berkeley's residential neighborhoods. This could lead to incrementally greater noise generated from existing sources such as human conversations on sidewalks and residential yards, especially during social gatherings. However, increased headcount would not introduce new sources of noise that may disturb residents, since neighborhoods near UC Berkeley already accommodate a high proportion of off-campus student rentals. Continued implementation of the Berkeley Noise Ordinance would also minimize exposure to high noise levels

generated on properties in the city. Good neighbor relations programs and activities established by the UC Berkeley, like Happy Neighbors, which educates students and their neighbors about community expectations and relevant policies and laws, will also help to minimize exposure to high noise levels. Other issues, such as the visual effect of littering caused by students living off-campus, are also addressed through programs such as Cal Move in and Move Out, which is a program established to decrease the environmental and social impacts of illegal dumping in near-campus neighborhoods at the start and end of the academic year, and to educate students about responsible disposal and reuse strategies. Sporadic littering does not rise to the level of a significant aesthetic impact under CEQA. Other indirect environmental effects of increased population are discussed in Chapter 13, Public Services, and Chapter 14, Transportation and Traffic, of the GSPP SEIR and would not result in additional significant environmental impacts beyond those anticipated in the 2020 LRDP EIR. Therefore, the Project, accounting for the updated campus headcount projections, would not result in significant indirect environmental impacts in off-campus neighborhoods.

Effects on the housing market are not in themselves environmental impacts, but the 2020 LRDP EIR analyzed this issue because it is a matter of public concern (2020 LRDP EIR Vol 1, p. 4.10-13 to 4.10-17). The 2020 LRDP EIR found that new UC Berkeley-provided housing would be more than adequate to accommodate projected growth in student enrollment, allowing students to vacate private housing units and make them available to other people. However, the projected increase of 11,285 students through the 2022-2023 school year beyond the 2020 LRDP EIR's projection for the year 2020 would exceed anticipated growth in UC Berkeley-provided housing, placing greater demand on the private housing market. Nonetheless, it is expected that UC Berkeley would have 1,228 fewer employees than projected in the 2020 LRDP for the year 2020, which would reduce pressure exerted by employee households on the private housing market. The 2020 LRDP anticipates construction of 2,600 student beds (2020 LRDP EIR Vol 1, p. 4.10-11), and the campus recently announced a plan to develop an additional 8,800 student beds within the next ten years. See Housing Master Plan Task Force Report (January 2017), https://evcp.berkeley.edu/sites/default/files/housing_master_plan_task_force_final_draft_january_2017.pdf. Please refer to *Thematic Response: Housing*, below, for further discussion of the effects of increased enrollment related to displacement of existing tenants from off-campus private housing.

Increased Use of Police Services, Fire, and Emergency Services

The updated population baseline related to the increase in enrollment beyond that projected in the 2020 LRDP EIR also does not have significant impacts in the City of Berkeley with regard to public services. UCPD provides a better officer to service population ratio than typical municipal police services and UCPD staffing continues to demonstrate a commitment to its service goal of 1.6 sworn officers per 1,000 campus population. Further, while these are matters of concern, under CEQA, staffing and support needs for public services are relevant only to the extent they translate into physical changes which in turn result in environmental impacts.

With respect to fire services, CEQA analysis again focuses on environmental impacts that could result from the construction of new facilities that are required to provide fire department services, not staffing or equipment purchases, which are fiscal matters.

The issue of emergency vehicle access to locations within the Campus Park is thoroughly evaluated for each project as part of the Plan Review and Construction Inspection procedures. The UC Berkeley Fire Marshal consults with the Berkeley Fire Department on the adequacy of emergency access routes from

City streets. In order to recognize this ongoing practice, Continuing Best Practice PUB-2.3 from the 2020 LRDP EIR will still be implemented as follows:

Continuing Best Practice PUB-2.3: UC Berkeley would continue its partnership with LBNL, ACFD, and the City of Berkeley to ensure adequate fire and emergency service levels to the campus and UC facilities. This partnership shall include consultation on the adequacy of emergency access routes to all new University buildings.

Utilities and Wastewater

All wastewater generated by UC Berkeley flows into relatively few sewer mains, and is transported through these mains to the EBMUD interceptor line. The actual physical impacts of UC Berkeley wastewater on the City sewer system, therefore, are limited to those few lines into which this wastewater is discharged. UC Berkeley will continue to implement 2020 LRDP Continuing Best Practice HYD-4-e to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions. Furthermore, there is no evidence that increases in population may tax existing facilities; the analysis of utilities and infrastructure contained in the Draft SEIR does not demonstrate that any such increased demand from an increase in population would necessitate the construction of new facilities that in turn could cause significant effects.

Severing Population Baseline from Proposed Project

Several commenters suggest that the campus should sever the campus population increase from the GSPP project and prepare two separate environmental documents. UC Berkeley does not believe that this approach is warranted for several reasons. First, the GSPP SEIR tiers from the 2020 LRDP EIR pursuant to CEQA Guidelines Section 15152. Accordingly, UC Berkeley cannot move forward with the GSPP SEIR and the Upper Hearst Development without bringing the 2020 LRDP EIR analysis current. Second, pursuant to CEQA Guidelines Section 15125(a), CEQA requires that the environmental impacts of a proposed project be evaluated in the context of existing conditions in the project area at the time that the Notice of Preparation is published, or in the case of the GSPP SEIR, August 15, 2018. Part of that baseline includes the increase in campus headcount over that projected in 2020 and as analyzed in the 2020 LRDP EIR. The campus cannot evaluate the Project's impacts without utilizing baseline conditions, or by comparing it to hypothetical baseline conditions that do not actually exist, and therefore cannot "sever" the existing population baseline from the analysis of the Upper Hearst Project.

An updated population baseline is not a "project" under CEQA. CEQA expressly provides that the environmental impacts of changes in enrollment levels are to be assessed at the campus level as part of the LRDP process for each campus. *See* Public Resources Code Section 21080.09(b). This CEQA provision governing higher education projects defines a LRDP as "a physical development and land use plan to meet the institutional and academic objectives for a particular campus..." Public Resources Code Section 21080.09(a)(2). LRDP approval is subject to CEQA, which requires the preparation of an EIR. CEQA requires a LRDP EIR to consider "[e]nvironmental effects relating to changes in enrollment levels ..." Public Resources Code Section 21080.09(b). Consistent with this requirement, when preparing LRDPs, campuses utilize enrollment projections to assist in determining the amount of physical development required to accommodate the projected student population, as well as the faculty and staff required to support that population. The impacts of this physical development are then, as required by CEQA, evaluated in the LRDP EIR. Population projections in the LRDP are just that; they do not establish a cap or limit on campus student enrollment or population.

The Draft SEIR establishes an updated population baseline to reflect the existing campus headcount (which is greater than the projections in the 2020 LRDP) and new campus headcount projections through the 2022-23 school year, when increased enrollment at GSPP as a result of the Project is anticipated to plateau. Despite the growth in campus headcount over 2020 LRDP projections, which led to the new baseline, the analysis in the GSPP SEIR demonstrates that the UC Berkeley campus is still operating within the capacity and demand identified and analyzed in the 2020 LRDP EIR. Moreover, to date, UC Berkeley has accommodated the increased campus headcount completely within the physical development identified in the 2020 LRDP and, in fact, has developed fewer square feet of academic and support space than what was identified in the 2020 LRDP and analyzed in the 2020 LRDP EIR.

Nonetheless, in its response to comments to the 2020 LRDP EIR, UC Berkeley made a commitment to the City of Berkeley that, if enrollment increased beyond the projections set forth in the 2020 LRDP, it would undertake additional review under CEQA. Consistent with this commitment, the GSPP SEIR uses an updated population baseline and, in its environmental analysis of each impact category, takes this updated baseline into account and explains how it factors into and/or affects the environmental analysis and significance conclusions reached in the 2020 LRDP EIR and the GSPP SEIR. For some impact categories, such as Aesthetics, Cultural Resources, Land Use, and Tribal Cultural Resources, the analysis of whether the increased headcount would cause environmental impacts hinges on physical development to accommodate an increased headcount. For other impact categories, such as Air Quality, Greenhouse Gas Emissions, Noise, Population, Public Services, and Transportation and Traffic, the analysis of whether the increased headcount would cause environmental impacts largely hinges on population numbers on the campus.

Furthermore, even if it would be feasible and appropriate to sever and prepare two separate environmental documents for the GSPP project and the campus population increase, the results of the environmental analysis would not change. As was analyzed in the Draft SEIR, the GSPP Project would result in new significant and unavoidable impacts, beyond those identified in the 2020 LRDP EIR, related to visual character and quality and land use compatibility. The increase in campus headcount does not result in environmental impacts more severe than those analyzed in the 2020 LRDP EIR.

Thematic Response: Update to 2020 LRDP and 2020 LRDP EIR

The GSPP SEIR is not the next campus LRDP EIR; rather, it is a project-level EIR for the Upper Hearst Development that also evaluates the environmental impacts of the updated campus headcount baseline. The campus is in the early stages of preparing the next UC Berkeley LRDP and LRDP EIR, which will analyze the environmental impacts of campus growth through approximately 2035, including any impacts that could result from growth greater than anticipated in the 2020 LRDP, as required by Public Resources Code Section 21080.09. As done in the 2020 LRDP EIR as a matter of public policy, the campus will in the next LRDP EIR analyze some of the social and economic issues raised by the City of Berkeley in its comment letter concerning jobs/housing imbalances, costs of City provided public services and infrastructure.

The appropriate method for UC Berkeley to analyze the impacts of the in-campus population is in LRDP EIRs. *See* Public Resources Code Section 21080.09. Public Resources Code Section 21080.09(a)(2) defines a “Long range development plan” as a “physical development and land use plan to meet the academic and institutional objectives for a particular campus or medical center of public higher education” and requires the preparation of an EIR prior to approval of a LRDP. *See* Public Resources Code Section 21080.09(b). Since the LRDP is a land use plan, the focus of the EIR is on the environmental effects of the physical

development plan. The statute also requires that the changes in projected enrollment levels for each campus be analyzed in the LRDP EIR. Compliance with section 21080.09 “satisfies the obligations of public higher education pursuant to this division to consider the environmental impact of academic and enrollment plans as they affect campuses.” See Public Resources Code Section 21080.09(d). Each campus LRDP contains an estimated projection of future student enrollment. This projection is not a plan for future enrollment, nor does it dictate, control, or cap future enrollment. Consistent with Public Resources Code Section 21080.09, UC Berkeley adopted the 2020 LRDP in 2005 to guide campus development, which contained an estimated projection of student enrollment. As such, the 2020 LRDP EIR analyzed the physical impacts of the development included in the 2020 LRDP.

In fact, but for the GSPP Project, under CEQA, UC Berkeley would have no legal obligation to analyze the impacts of increased student population or campus headcount as the 2020 LRDP EIR is deemed to be presumptively valid for all purposes under CEQA despite any changes or new information. Pursuant to PRC Section 21167.2, if there is no legal challenge to an EIR during the 30-day statute of limitations period, then the EIR “shall be conclusively presumed to comply” with CEQA “unless the provisions of Section 21166 are applicable.” See *Laurel Heights Improvement Ass’n v. Regents of Univ. of Cal.* (1993) 6 Cal.4th 1112, 1130 (“This presumption acts to preclude reopening of the CEQA process even if the initial EIR is discovered to have been fundamentally inaccurate and misleading in the description of a significant effect or the severity of its consequences.”) Because of this conclusive presumption of validity, when the statute of limitations for challenging an EIR or negative declaration has run, the overall adequacy of the document is irrelevant. After certification, the interests of finality are favored over the policy of encouraging public comment. See *Laurel Heights, supra*, 6 Cal.4th at 1130. “These limitations are designed to balance CEQA’s central purpose of promoting consideration of the environmental consequences of public decisions with interests in finality and efficiency.” *Friends of College of San Mateo Gardens v. San Mateo County Community College District* (2016) 1 Cal.5th 937, 949. A public agency may require a subsequent EIR only when the agency grants a discretionary approval; once all discretionary approvals have been obtained, no agency has jurisdiction to require a further EIR. *Cucamongans United for Reasonable Expansion v. City of Rancho Cucamonga* (2000) 82 Cal.App.4th 473, 479. The only question that may be considered by an agency before a further discretionary approval for the project is whether one of the three exceptions triggering the need for a subsequent or supplemental EIR exists. See *Committee for Re-Evaluation of the T-Line Loop v. San Francisco Mun. Transp. Agency* (2016) 6 Cal.App.5th 1237, 1251.

Furthermore, any suggestion that would require UC Berkeley to engage in an annual stand-alone CEQA review of student enrollment has no support under CEQA. UC Berkeley would be in the position of having to analyze the environmental impacts of its student enrollment, which fluctuates each academic year. Courts would have to resolve annual challenges to the environmental analysis of enrollment levels, and could block enrollment until the analysis was done. This scenario is contrary to CEQA’s requirements for analysis of enrollment levels in LRDPs. Any such analysis would also impermissibly intrude into UC Berkeley’s power over public higher education under the State Constitution. UC Berkeley has plenary authority over higher education in the State. The University of California became a “public trust” in 1879 as part of a larger revision of California’s Constitution approved by California voters. (Cal Constitution, Art. IX, Sec. 9.) The 1879 Constitution granted the University of California the exclusive power to operate, control, and administer public higher education, becoming virtually a fourth branch of state government, a “constitutional corporation . . . equal and coordinate with the legislature, the judiciary and the executive.” (30 Ops.Cal.Atty.Gen. 162 (1957).) Employing such a policy to control annual student enrollment levels would contravene these constitutional powers. It would also be practically impossible for UC Berkeley to conduct annual CEQA analysis of its enrollment numbers before commencing student

instruction each academic year. This issue was recently adjudicated in the Superior Court of California, County of Alameda, and the Court found in the University's favor.

CEQA does not require that the UC Berkeley campus halt all development projects that are needed on the campus until it has prepared an update to the 2020 LRDP EIR.

Thematic Response: People's Park

A number of commenters expressed concern regarding potential changes to, or development at, People's Park, and cited the importance of this UC Berkeley property for its common open space, history, and trees.

The proposed Project studied in the Draft SEIR does not include or contemplate, nor would it directly facilitate, development at or changes to People's Park. The projected increase in student enrollment analyzed in the Draft SEIR could increase the need for new physical development on UC-owned properties such as People's Park. Separate from the proposed Project, UC Berkeley is currently planning to develop new student housing at People's Park, as well as supportive housing. Such future development at People's Park would require a separate environmental review process and documentation under CEQA.

Thematic Response: Aesthetics

Many commenters suggested that the proposed Upper Hearst Development should be redesigned to be more compatible with the surrounding neighborhood in terms of scale and architectural design. Several commenters expressed support for the Reduced Scale Alternative or a residential building limited to three or four stories in height. A number of commenters also noted the existence of landmarked historical resources in the vicinity of the project site and requested that the project be redesigned for compatibility with, and to avoid indirect impacts to, such resources. In addition, commenters expressed concern about instability in the description of the Upper Hearst Development, with respect to the appearance of the proposed buildings.

During the public review process, the design of the proposed residential building evolved. While the Draft SEIR evaluates a residential building of up to six stories with no setback from adjacent streets, representing the maximum foreseeable scope of development on the Project site, the current design comprises a combination of the alternatives analyzed in the Draft SEIR. The Upper Hearst Development would completely demolish and partially replace the parking structure with greater lot coverage but fewer parking levels and construct separate residential and academic buildings. The residential building component of the Upper Hearst Development has been reduced to five stories consisting of up to 150 units with no setbacks from adjacent streets. Additionally, the site plan has been revised with a single driveway on La Loma Avenue that would have a right-turn only exit to funnel traffic to the south. The revised Project would not have a driveway on Hearst Avenue. As demonstrated in the Final SEIR, potential impacts of the Project, as revised, would be similar to or less than those of the original Project analyzed in the Draft SEIR.

Consistent with the comments received on aesthetic impacts, the Aesthetics analysis in the Draft SEIR acknowledges that the proposed buildings on the Project site would be higher and of greater mass and scale than all buildings in the surrounding neighborhood. In addition, the Draft SEIR finds that massing and design of these buildings would depart from and compromise the setting of adjacent historic resources that were built in the First Bay Tradition architectural style. Therefore, the Draft SEIR

determines that the new buildings would have a significant and unavoidable impact on the neighborhood's visual character and quality. Because the Draft SEIR assumes construction of a residential building up to six stories in height, the currently proposed five-story residential building would be slightly more compatible in scale with adjacent buildings that range from one to four stories in height. However, consistent with the Draft SEIR's determination, the Upper Hearst Development would still have a significant and unavoidable impact on visual character and quality due to its scale, mass, and palette of exterior building materials.

The commenters' support for the Reduced Scale Alternative and request for a redesigned Upper Hearst Development that is more compatible with historical resources are noted and will be forwarded to UC decision-makers for their consideration. For further discussion of the Upper Hearst Development's impacts on historical resources related to the design and scale of proposed buildings, please refer to the responses to Letter A1 from the Landmarks Preservation Commission and Letter ORG1 from the Berkeley Architectural Heritage Association (BAHA).

Thematic Response: Noticing and Consultation

Several members of the public suggested that neighborhood noticing regarding the proposed project and the availability of the Draft SEIR was insufficient. Some faculty and staff members expressed concern that they were not informed of and/or sufficiently consulted regarding the proposed Project.

The Upper Hearst parking structure was initially identified as a potential site for a housing project of approximately 75 – 100 apartments in UC Berkeley's Housing Master Plan Task Force Report issued in January 2017, which was shared campus-wide and extensively covered in the media. In March 2018, UC Berkeley posted an information page for the Upper Hearst Development on the Capital Strategies website, including an overall description, scope and renderings. On March 15, 2018, the Vice Chancellor of Student Affairs and Associate Vice Chancellor of Capital Strategies shared news of the forthcoming Upper Hearst Development in a campus-wide housing update. On March 20, 2018, Capital Strategies and the Goldman School of Public Policy (GSPP) hosted an open house where the campus and community were invited to learn about the proposed Upper Hearst Development in detail and view renderings, and to engage in meaningful dialog with representatives from the campus, GSPP and development team. Flyers for the open house were distributed and posted around the community by GSPP staff and students. Flyers were also emailed to the building coordinators of adjacent UC Berkeley buildings to share with their departments. The open house was also advertised by email through Capital Strategies' campus and community contact list for Project updates. Following the March 2018 public open house, on June 21, 2018, the City of Berkeley Design Review Committee discussed the Upper Hearst Development, and on July 5, 2018, the City of Berkeley Landmarks Preservation Commission also discussed the Project. The UC Berkeley Design Review Committee and Seismic Review Committee each reviewed the Upper Hearst Development several times in 2018 and 2019.

UC Berkeley also complied with the requirements of CEQA by providing information about the Project and its environmental consequences to the public and the UC Berkeley community. In July 2018, UC Berkeley published a Notice of Preparation soliciting comments on the scope and content of the Supplemental EIR and widely distributed it to public agencies, property owners, and other interested parties. Five formal letters were received in response to the NOP, and were reprinted in Appendix A to the Draft SEIR. The comments in these letters relevant to the environmental analysis pertained to population growth, compatibility with historic resources, and utilities. Each of these topics is addressed in the SEIR's resource area analysis. On February 20, 2019, UC Berkeley published a Notice of Availability

of a Draft SEIR via Berkeley News, online public notice, through postal mailing to adjacent property owners within 400 feet of the perimeter of the project site, and through the Capital Strategies email contact list. Capital Strategies hosted two public hearings during the extended 49-day public comment period (one on March 12 and again on March 21) for the Draft Supplemental EIR during which public comments were received.

Concerning the location of the March 2019 public hearings, UC Berkeley Office of Physical and Environmental Planning spent numerous hours organizing both public hearings, particularly to identify an appropriate venue to hold the hearings. While there are numerous campus meeting spaces nearby the Project site, as pointed out by more than one commenter, these venues were either occupied or not reservable the evenings of the public hearings. Additionally, UC Berkeley staff did not know how many members of the public would attend the hearings so larger venues were identified. Staff settled on the two venues for the public hearings because they were relatively easily accessible and available. The Project was discussed by The UC Regents March 2019 meeting and will be brought back to The Regents for approval on May 15, 2019.

Based on the above information, UC Berkeley provided adequate notification of the Project to interested parties and fully complied with CEQA's noticing requirements during the environmental review process.

Thematic Response: Proposed GSPP Events Space

Several commenters questioned the need for the proposed academic building's events space at the size proposed and requested evidence that such a space is needed by the GSPP, as well as more information on whom it would serve. Some commenters also suggested that the impacts that would result from use of the events space related to issues including traffic and parking were not adequately studied in the Draft SEIR.

The space would be designed to accommodate a classroom layout of two rooms each with 96 seats, with tables and chairs, as well as a single space for events that could accommodate up to 301 attendees. Per the fire marshal, maximum occupancy signs would be posted for 301 occupants. Therefore, the text of the SEIR has been revised to state that the event space could accommodate up to 301 occupants at full capacity.

Page 2 in Draft SEIR Section 1.1, *Project Summary*, is revised in the Final SEIR as follows:

As a result of removing existing parking areas, it is assumed that the Upper Hearst Development would reduce the total number of parking spaces on-site from 407 to approximately 200, including 175 171 marked parking spaces and 25 attendant parking spaces. One driveway from La Loma Hearst Avenue would provide vehicular access to the parking garage.

Page 3 in Draft SEIR Section 1.1, *Project Summary*, is revised as follows:

The academic building's event space would have a seating capacity of 300 and would accommodate up to 301450 visitors at maximum capacity; public and private events would occur periodically during both daytime and evening hours but it is anticipated that events would reach full capacity only a couple of times per year.

Page 19 in Draft SEIR Section 3.5, *Project Description*, is revised as follows:

It is anticipated that the Upper Hearst Development would accommodate up to approximately 1,027~~1,176~~ occupants, including up to 301~~approximately 300 people seated and up to 450~~ occupants at maximum capacity in the academic event space; public and private events in this space would occur periodically in the day and evening.

Page 37 in Draft SEIR Section 3.5, *Project Description*, is revised as follows:

**Table 2:
Estimated Project Occupancy**

Use	Size	Occupancy Rate	Occupants
Residences	225 bedrooms	1 person/bedroom	225
Residential amenity space	1,250 sf	1 person/100 sf	13
Academic offices	9,090 sf	1 person/100 sf	91
Academic classrooms	5,950 sf	1 person/ 15 sf	397
Academic event space	3,150 sf	1 person/7 sf	<u>301</u> 450 ¹
Total			<u>1,027</u>1,176

¹ Estimated occupancy of academic event space including standing room for 301~~450~~ people.

Source: Solomon Cordwell Buenz, April 2019~~May 2018~~

Page 38 in Draft SEIR Section 3.5, *Project Description*, is revised as follows:

It is anticipated that the event space would accommodate up to 301~~300 people seated and 450 visitors~~ at maximum capacity.

The fourth floor at the proposed academic building would be a large space that could be divided into two classrooms or a single space that could accommodate up to 301 occupants. GSPP events would typically use only half of this floor and UC Berkeley anticipates up to 40 events during the academic year that could use the space. Many GSPP events that occurred this academic year could be held at the event space and include:

- GSPP Career Fair on March 15 (instead of at I-House)
- Berkeley Institute for the Future of Young Americans (BIFYA) talk on democracy on March 19
- New Admit day on April 5 (instead of at the existing GSPP buildings)
- The Students of Color in Public Policy (SCiPP) conference talks during week of April 8 to 12 (instead of at Bechtel Auditorium or Room 250 of GSPP's 1893 Le Roy Avenue building in the evenings)
- Spring Board meeting on April 9 (instead of at the Faculty Club)
- Environmental Policy Group Spring dinner on April 18 (instead of the Living Room in GSPP's 2607 Hearst Avenue building)
- Clark Kerr Lecture on April 19 (instead of at Sutardja Dai Hall)
- Homecoming talks on October 19 (instead of at Lippman Room, I-House, and Alumni House, as in the past)
- Fall Board meeting on November 13 (instead of at Faculty Club)

In the vicinity of the Project site, vehicle trips and parking demand associated with events at the academic building would be additional to the average daily levels estimated in the Transportation Assessment for the Upper Hearst Development (Appendix F to the Draft SEIR). As discussed in Draft SEIR's Transportation and Traffic analysis, it is estimated that the Upper Hearst Development would reduce existing AM peak-hour traffic by 41 vehicle trips and PM peak-hour traffic by 13 vehicle trips as a result of reducing parking availability on the Project site. On an occasional basis during special events, vehicle trips could increase beyond existing conditions near the Project site because of attendees traveling by motor vehicle. However, as the anticipated special events are currently already hosted on campus, they would not generate additional vehicle trips and parking demand on a campus-wide basis. It is assumed that attendees would park as they do now: in visitor lots with shuttles, as many of them are visitors to the area for the day and not regular faculty or students or staff. Town halls occur during normal business hours and students are already on site. Many events also would use only half the space, with an estimated attendance of 100 to 200 people. Of the GSPP events noted above, UC Berkeley expects that during the 2018-2019 school year only two events – the Berkeley Institute for the Future of Young Americans and Homecoming talks – would plausibly use the academic building's event space at full capacity.

Many events at the academic building would occur during midday or evening hours and would not generate substantial vehicle trips during peak-hour traffic. GSPP is also primarily a graduate school and many events are geared towards students and faculty. UC Berkeley's most recent Transportation Survey from 2016 indicates that attendees would typically walk or bicycle to events. The walking mode share is 25 percent for graduate students, 63 percent for undergraduates, and 11 percent for faculty. In addition, the bicycle mode share is 24 percent for graduate students, 9 percent for undergraduates, and 18 percent for faculty. Therefore, a substantial proportion of attendees would walk or bike to and from the academic building, reducing the increase in trips and parking demand during occasional events.

Although the Upper Hearst Development would have a less than significant impact on traffic conditions without mitigation, the Draft SEIR has been amended to require a new mitigation measure to manage vehicle trips generated by special events at the proposed academic building. This new mitigation measure would replace the original Mitigation Measure T-1 from the Draft SEIR, which as discussed in *Thematic Response: Traffic* has been deleted in the Final SEIR. Page 168 of the Draft SEIR has been amended as follows:

In addition to average daily traffic associated with the Upper Hearst Development, UC Berkeley anticipates up to 40 events per year at the proposed academic building that would also generate vehicle trips near the Project site. Many events at the academic building would occur during midday or evening hours and would not generate substantial vehicle trips during peak-hour traffic. GSPP is also primarily a graduate school and many events are geared towards students and faculty. UC Berkeley's most recent Transportation Survey from 2016 indicates that attendees would typically walk or bicycle to events. The walking mode share is 25 percent for graduate students, 63 percent for undergraduates, and 11 percent for faculty. In addition, the bicycle mode share is 24 percent for graduate students, 9 percent for undergraduates, and 18 percent for faculty. Therefore, a substantial proportion of attendees would walk or bike to and from the academic building, reducing the increase in trips and parking demand during occasional events. Considering these factors and the expected decrease in average daily traffic near the Project site, the~~The~~ Upper Hearst Development would have a less than

significant impact on the performance of the circulation system. Nonetheless, Mitigation Measure T-1 would be required to manage vehicle trips generated by special events at the academic building, further reducing the already less-than-significant traffic impact.

MM-T-1 Prior to occupancy of the Upper Hearst Development, UC Berkeley shall, in consultation with a qualified transportation engineer, prepare and approve a transportation management plan for special events at the proposed academic building that are expected to have at least 200 external attendees. Once the Upper Hearst Development is in operation, UC Berkeley shall implement the plan, which shall include a menu of options for UC Berkeley to implement to minimize the effect of special events on traffic congestion near the Project site, which may include but are not limited to:

- Scheduling events during non-peak times (evenings and weekends), to the extent feasible
- Informing event attendees of appropriate parking and pick-up/drop-off locations
- Considering the posting of flagpersons to manage pick-up and drop-off activity on Hearst Avenue and/or vehicles entering and exiting the Upper Hearst parking structure
- Considering monitoring of traffic conditions during special events and modifying the transportation management plan as appropriate

Implementation of Mitigation Measure T-1 to manage vehicle trips associated with special events would further reduce the Upper Hearst Development's already less-than-significant traffic impact.

Thematic Response: Housing

Several commenters suggested that UC Berkeley has not built enough housing for students to keep pace with the enrollment increase, and that more housing affordable to students is needed. Other comments expressed concern about the effects of increased enrollment on the off-campus rental market, asserting that existing Berkeley residents could be displaced in favor of student tenants.

Draft SEIR Section 4, *Relationship to 2020 LRDP*, acknowledges that during implementation of the 2020 LRDP, UC Berkeley has added less than half of the planned 2,600 new student beds as of the end of 2018. After construction of up to 150 housing units in the proposed Upper Hearst Development, substantial capacity for additional student housing would remain under the 2020 LRDP. The commenters' request for UC Berkeley to provide more student housing, including housing with more affordable rents than market-rate conditions, is consistent with the 2020 LRDP's development plans. UC Berkeley is committed to developing approaches to provide financial relief to certain affiliates, if needed, and is exploring an additional subsidy for faculty living at the proposed residential building. While this request does not question or challenge the adequacy of the Draft SEIR's environmental analysis or conclusions, it will be forwarded to UC decision-makers for their consideration when planning for the future construction of student housing. UC Berkeley's current Housing Initiative proposes to add approximately 8,800 beds over the next ten years. Please refer to *Thematic Response: Environmental Analysis of the Updated Population*

Baseline for a discussion of the environmental impacts of accommodating increased student enrollment, including the effects of students living off-campus.

The 2020 LRDP EIR found that implementation of the 2020 LRDP would not displace substantial numbers of people or housing (2020 LRDP EIR Vol 1, p. 4.10-10). As discussed in Item 12, Population and Housing, in Draft SEIR Section 6, *Environmental Evaluation*, additional student enrollment through the 2022-2023 school year would exert greater demand on the private housing market. Greater housing demand would increase the incentive to construct additional private housing that caters to UC Berkeley students. If future projects are proposed that would require the displacement of substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere, their environmental impacts would be evaluated as required by CEQA on a project-specific basis (2020 LRDP EIR Vol 1, p. 4.10-10). The potential displacement of existing tenants in Berkeley also could result in an incremental increase in the population of homeless people living in Berkeley, although the social impacts of displacement are beyond the scope of environmental review under CEQA. The proposed increase in the headcount also may necessitate the construction of new UC Berkeley-provided housing; however, such construction would not require substantial displacements because the 2020 LRDP's land use strategy prioritizes the siting of new housing on UC Berkeley's current property and, where necessary, acquiring other sites where the displacement of existing tenants can be minimized. This impact would be within the scope of the 2020 LRDP EIR's analysis and less than significant.

Thematic Response: Need for Academic Building

Several comments questioned the need for an approximately 37,000 square-foot academic building, asking how a building of this size would be commensurate with GSPP's need for additional physical facilities. The proposed academic building would be approximately 37,000 gsf but contain no more than 20,000 assignable square feet (ASF). (Gross square feet is the total area of a building while assignable square feet is the net usable area that can be used for programs or assigned to occupants and does not include corridors, stairs, elevators, bathrooms, etc.) This results in an academic building with an efficiency factor of usable space of about 53 percent. This is less than a "typical" campus academic building because of the relatively small Project site, which results in a very small floor plate. Moreover, because the east side of the academic building would not have windows, it has been designed with generous circulation space, such as corridors, to bring as much daylight as possible to recessed areas. GSPP's two existing buildings are inadequate to serve the program: faculty do not have space for their research clusters; graduate student instructors and tutors must hold sections and office hours in open areas; there is no space for research centers or office space for temporary faculty and lecturers; there is no space for additional lockers for students or lecturers; existing staff share individual offices between two to three people; teaching space is inadequate; and the program is at risk of losing hiring and retention cases because their research teams cannot be housed nearby.

Thematic Response: Traffic

Several comment letters expressed concern about the traffic impacts of the Upper Hearst Development. These repeated concerns addressed the accuracy of trip generation estimates for the Upper Hearst Development and the influence of ride-share trips. Other traffic-related comments raised by individual comment letters are addressed in responses to those respective letters, in particular Letter A 8 and Letter IND 124.

In addition to the above comments, UC Berkeley has updated aspects of the Upper Hearst Development that necessitate revisions to the Draft SEIR's traffic analysis. Whereas the Draft SEIR assumed

approximately 200 parking spaces in the rebuilt Upper Hearst parking structure, the currently proposed development would provide 171 parking spaces. The proposed driveway to the rebuilt Upper Hearst parking structure has also been relocated from Hearst Avenue to La Loma Avenue, approximately 100 feet north of the intersection of Hearst and La Loma avenues. The new driveway would have a right-turn only exit so that traffic is funneled to the south, away from neighbors of the Project site. These changes to the Project description affect the trip generation estimates and driveway operations analysis for the Upper Hearst Development.

Sight distance at the proposed driveway would be adequate, which would eliminate potential traffic safety issues assumed in the Draft SEIR due to vehicles entering and exiting the driveway. Therefore, the original Mitigation Measure T-1 in the Draft SEIR, to improve sight distance, would no longer be necessary and has been deleted in the Final SEIR. (Please refer to *Thematic Response: Proposed GSPP Events Space* for a discussion of trip generation by occasional special events at the proposed academic building. As discussed therein, a new Mitigation Measure T-1 to implement a traffic management program during special events would further reduce the Upper Hearst Development's already less-than-significant traffic impact.)

Based on the above changes, UC Berkeley has revised the Draft SEIR's trip generation estimates on page 166 as follows:

Table 18 presents the trip generation estimates for the Upper Hearst Development. It is estimated to increase daily trip generation by about 150 trips, and reduce peak hour trip generation by about ~~4115~~ trips during the AM peak hour and ~~1315~~ trips during the PM peak hour. The reason that daily trips increase while peak hour trips decrease is due to the difference in the trip generation rate per space during the peak and off-peak hours. The trip generation rate per space is lower in the off-peak hours because most parking structure users enter and exit during the peak hours. Thus, the removal of parking would result in a relatively smaller decrease in daily trips than the decrease during peak hours.

**Table 18:
Upper Hearst Development Trip Generation Estimates**

Land Use	Size ¹	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
Campus Housing								
Campus Housing	225 Bedrooms	710	11	16	27	28	28	56
Academic Building								
Graduate Student ²	30 Students	10	1	0	1	0	1	1
Faculty and Staff ³	30 Persons	30	6	1	7	1	5	6
Subtotal		40	7	1	8	1	6	7
Parking Structure ⁴								
Parking Structure	-235207 Spaces	-600	-7048	-62	-7650	-115	-6562	-7668
Net New Trips		150	-5230	115	-4115	184	-3118	-135

¹ ITE Trip Generation (10th Edition) land use category 225 (off-campus student apartment) adjacent to campus setting:

Daily Rate: 3.15 trips per bedroom

AM Peak Hour Rate: 0.12 trips per bedroom (41% in, 59% out)

PM Peak Hour Rate: 0.25 trips per bedroom (50% in, 50% out)

² Based on the UC Berkeley 2020 LRDP methodology and the travel modes from 2016-2017 survey data:

Daily Rate: 0.23 trips per student

AM Peak Hour Rate: 0.05 trips per student (91% in, 9% out)

PM Peak Hour Rate: 0.05 trips per student (12% in, 88% out)

³ Based on the UC Berkeley 2020 LRDP methodology and the travel modes from 2016-2017 survey data:

Daily Rate: 0.85 trips per faculty/staff

AM Peak Hour Rate: 0.20 trips per faculty/staff (91% in, 9% out)

PM Peak Hour Rate: 0.19 trips per faculty/staff (12% in, 88% out)

⁴ Based on peak period driveway counts at the existing Upper Hearst parking facilities:

Daily Rate: 2.6 trips per parking space

AM Peak Hour Rate: 0.24 trips per parking space (96% in, 4% out)

PM Peak Hour Rate: 0.33 trips per parking space (23% in, 77% out)

Source: Fehr & Peers 2019~~8~~

In addition, the Draft SEIR's traffic analysis on page 168 has been revised accordingly:

The 2020 LRDP EIR determined that implementation of the 2020 LRDP would increase vehicle trips and traffic congestion at signalized intersections, leading to a significant and unavoidable impact on traffic flow because no mitigation measures would be feasible (2020 LRDP EIR Vol 1, p. 4.12-53). However, the trip generation analysis provided above estimates that the Upper Hearst Development would reduce existing AM peak-hour traffic by ~~4115~~ vehicle trips and PM peak-hour traffic by ~~1315~~ vehicle trips. Therefore, it would not considerably contribute to the 2020 LRDP program's significant and unavoidable impact on traffic flow.

As discussed above, it is estimated that the Upper Hearst Development would result in fewer average peak-hour vehicles trips to and from the Project site than under existing conditions. (This revised estimate of trip generation factors in updated traffic counts at driveways to the existing Upper Hearst parking structure, as noted in Response IND 124.3.) The revised driveway operations analysis also finds that peak-hour traffic on La Loma Avenue would, for a short period of time, result in vehicle queues on La Loma Avenue that block access to the proposed driveway. Similar to existing conditions, queues would generally clear within each signal cycle at the intersection of Hearst and La Loma avenues. Therefore, queuing conflicts at the driveway would be less than significant. However, page 168 of the Draft SEIR has been amended as follows to require mitigation that would further reduce this less-than-significant impact:

MM-T-2 To minimize blockage of the driveway to the Upper Hearst parking structure on La Loma Avenue, UC Berkeley shall coordinate with the City of Berkeley to provide "KEEP CLEAR" pavement markings on southbound La Loma Avenue adjacent to the driveway.

Implementation of Mitigation Measure T-2 would substantially reduce blockage of the proposed driveway during peak-hour traffic conditions on La Loma Avenue.

Consistent with the Draft SEIR's determination, the Upper Hearst Development would have a less than significant impact on the performance of the circulation system. This impact would be further reduced with mitigation implemented, although such mitigation is not necessary to achieve a less-than-significant impact.

The discussion of traffic safety on pages 169 and 170 in Draft SEIR Section 6, *Environmental Evaluation*, is revised as follows:

The Upper Hearst Development would involve reconfiguring access to the rebuilt parking structure on the Project site. Whereas the existing parking structure has three driveways, from Hearst and La Loma avenues and Ridge Road, the new parking structure would have a single driveway from ~~Hearst~~-La Loma Avenue. Based on ~~preliminary~~ site plans for the parking structure, the new ~~Hearst~~-La Loma Avenue driveway ~~may not~~would provide adequate sight distance between vehicles exiting the driveway and pedestrians on the adjacent sidewalk (Appendix F). Adequate sight distance is defined as a clear line-of-sight between a motorist 10 feet back from the sidewalk and a pedestrian 10 feet away on each side of the driveway. Therefore, the Upper Hearst Development would have a less than significant impact on traffic safety.~~The potential lack of adequate sight distance would introduce a traffic hazard due to a design feature. Implementation of Mitigation Measure T 1 would be required to ensure adequate sight distance.~~

~~**MM-T 1** The driveway to the rebuilt Upper Hearst parking structure on Hearst Avenue shall be designed to provide adequate sight distance between vehicles exiting the parking garage and pedestrians on the adjacent crosswalk. Adequate sight distance is defined as a clear line of sight between a motorist 10 feet back from the sidewalk and a pedestrian 10 feet away on each side of the driveway. If the driveway cannot be sited to provide adequate sight distance, UC Berkeley shall install mirrors on both sides of the driveway to aid drivers' and pedestrians' visibility. In addition, UC Berkeley shall install flashing lights to alert pedestrians when a vehicle is exiting the driveway.~~

~~With implementation of Mitigation Measure T 1, adequate sight distance would be provided at the driveway to the Upper Hearst parking structure. The Upper Hearst Development would not involve other significant changes in the road or path system, nor would it introduce any new types of vehicles that could create new design hazards. Therefore, the Upper Hearst Development's impact related to design hazards would be within the scope of the 2020 LRDP EIR's analysis and less than significant. The increase in UC Berkeley's existing and projected headcount would not require additional physical changes beyond those anticipated in the 2020 LRDP in the road or path system or introduce new roadway hazards. This impact would be less than significant.~~

Thematic Response: Fiscal Impacts

Several comment letters contend that the Draft SEIR minimizes or underrepresents current and future potential fiscal impacts of UC Berkeley students living off-campus on City of Berkeley services. As a State entity, UC Berkeley is constitutionally exempt from both local regulations and local taxes. Like other State

institutions, UC Berkeley is presumed to serve the public interest, and transferring funds from the State to local jurisdictions is considered not to serve the broader public interest.

Further, the matter of payments for city services is an economic issue not within the scope of CEQA, and an environmental impact report prepared in accordance with CEQA is not required to analyze or disclose such fiscal impacts. Section 15131 of the CEQA Guidelines states:

Economic or social information may be included in an EIR or may be presented in whatever form the agency desires.

a) Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

Because CEQA provides for analysis of environmental impacts, but not fiscal impacts, the analyses in the Draft SEIR are limited to environmental impacts resulting from the physical requirements of new services required for the Project. Staffing and support needs for police services, fire and emergency services, and other public services and utilities are relevant under CEQA only to the extent they translate into the need for alteration of existing facilities or construction of new facilities, which in turn result in environmental impacts. The Project would not require or result in substantial physical impacts associated with new or physically altered emergency or utility service facilities, which is the criterion of significance.

However, while fiscal impacts are not within the scope of CEQA, UC Berkeley recognizes they are a matter of concern to Berkeley and other cities and service agencies. They are also a matter of concern to UC Berkeley, which depends on the adequacy and quality of some public services those cities and agencies provide. UC Berkeley had extensive back and forth discussions regarding fiscal impacts with the City of Berkeley in connection with the preparation of the 1990 LRDP and the 2020 LRDP, and it will continue to engage the City of Berkeley in future market and fiscal impact analyses during the preparation of its update to the 2020 LRDP.

For certain fiscal impacts, namely those related to utility infrastructure, the conditions under which UC Berkeley is authorized to make payments to cities and other public utility service providers are established by Government Code section 54999. Such payments are limited to the capital cost of public utility facilities, and must be “nondiscriminatory”: the fee must be determined based on the same objective criteria and methodology applicable to comparable nonpublic users, and represent the proportionate share of the cost of the public utility facilities of benefit to the person or property being charged, based upon the proportionate share of use of those facilities.

There is, therefore, no question UC Berkeley is subject to fees within these categories, albeit within the limitations prescribed in Government Code section 54999, which include the requirements such fees be limited to capital facilities, and those fees be assessed based on a methodology that ensures UC Berkeley pays only its fair and equitable share of those capital facilities.

Project's Effects on Housing

Additional student enrollment through the 2022-2023 school year would exert greater demand on the private housing market. Greater housing demand could increase the incentive to construct additional private housing that caters to UC Berkeley students in the City of Berkeley and surrounding communities. The potential displacement of existing tenants in Berkeley also could result in an incremental increase in the population of homeless people living in Berkeley, although the social impacts of displacement are beyond the scope of environmental review under CEQA.

Jobs-Housing

While changes in the housing market are not in themselves environmental impacts as defined by CEQA, the jobs-housing balance in the city and region is a matter of public concern, and is addressed extensively in the Berkeley General Plan.

In 2003, UC Berkeley had 2,370 single student beds outside the scope of the 2020 LRDP under construction or in design. This included 1,110 single undergraduate student beds then under construction on three sites in the Southside, as well as up to 1,260 single graduate student beds in design for University Village in Albany.

Assuming that private market units vacated by students to reside in new campus student housing would house an average of 2.7 students, private market units could become available to UC employees and other non-students as a result of student housing production on the UC Berkeley campus and within the Housing Zone. While not all these student-vacated units would be suitable for all new employees, UC Berkeley has a diverse workforce, and many UC employees would benefit either directly, by being able to find reasonable, suitable housing closer to campus, or indirectly, though the easing of demand on the constrained private housing market.

As discussed in the 2020 LRDP EIR, the impact on jobs-housing balance in the Primary Employee Housing Area (EHA) is almost certainly overstated in the 2020 LRDP EIR analysis, since it assumes that 100 percent of new UC Berkeley employees would seek housing in the Primary EHA as shown in Figure 4.10-1 in the 2020 LRDP EIR, whereas only 50 percent of UC Berkeley employees lived in the Primary EHA in 2005. Therefore, while the projected imbalance in jobs and housing growth in the EHAs by 2020 – with or without the 2020 LRDP – is substantial, employment growth due to the 2020 LRDP is expected to account for no more than four percent of this imbalance in the Primary EHA, and no more than one percent of this imbalance in the Secondary EHA, if all of the aforementioned UC Berkeley housing is constructed. This percentage may further decrease considering that there are fewer UC Berkeley employees than projected in the 2020 LRDP EIR.

Letter A 1

COMMENTER: Steven Finacom, Chairperson, Landmarks Preservation Commission

DATE: March 7, 2019

Response A 1.1

The commenter states an opinion that the Draft SEIR fails to note additional city landmarks and historical resources near the Project site. In addition, the commenter encourages UC Berkeley to strengthen the Draft SEIR's historical analysis by using information provided on the Berkeley Architectural Heritage Association (BAHA) website.

In terms of the adequacy of the evidence gathered for the study, the Draft SEIR is not intended as a comprehensive survey or original scholarship on the history of the project site and its surroundings. In accordance with standard CEQA and professional practice as well as National Park Service guidance, the analysis in the Draft SEIR is intended to provide adequate context and evidence such that the potential impacts of the proposed project can be analyzed and disclosed.

Toward this end, the Draft SEIR Cultural Resources section draws on archival research and a broad literature review to accurately characterize the context of the project area and to ensure that historical resources within or directly adjacent to the project site could be evaluated within their appropriate historic context. The research methodology included all due diligence steps ordinarily undertaken for CEQA analysis, including a site visit, records search of the California Historical Resources Information System at the Northwest Information Center, as well as focused archival and online research. Archives consulted included the City of Berkeley Public Library, including the Central Library History Room. A pioneering study of the architectural heritage of the North Berkeley Hills, written by former BAHA president and Berkeley Landmarks Preservation Commission member, the late Susan Dinkelspiel Stern Cerny, provided valuable context on the importance of the historical resources in and around the project site.

Through this research and literature review, two principal themes emerged for the resources within or adjacent to the Project site: first, the role of the subject properties and surrounding neighborhood as a significant site for development of the "First Bay Tradition" of Arts and Crafts architecture, and second, the history of the subject properties and surrounding neighborhood as the site of Daley's Scenic Tract and 1923 Berkeley fire.

Pages 74 through 78 of the Draft SEIR include an exploration of the First Bay Tradition and the Arts and Crafts Movement in the North Berkeley Hills, as relates to Daley's Scenic Tract and the project neighborhood. On page 76, the Draft SEIR Cultural Resources section acknowledges that "Available literature on the First Bay Tradition and West Coast Arts and Crafts architecture illustrates the important role played by the North Berkeley Hills themselves in the development of the Bay Area version of the Arts and Crafts movement." On page 78 of the Draft SEIR, the role and importance of Daley's Scenic Tract and the setting of the Berkeley Hills themselves in the establishment of this significant architectural idiom are further asserted:

The significance of Cloyne Court, the Beta Theta Pi house, and Phi Kappa Psi extends beyond their architectural designs and individual site plans to include the surrounding

hillside setting, landscaping, and neighborhood context. These buildings are among only 50 to have survived the 1923 Berkeley Fire, which destroyed nearly 500 buildings in an area “where the First Bay Tradition dominated the built environment before 1923” (Preservation Architecture 2007).

Based on this contextual research and analysis, the Draft SEIR found a potential significant adverse impact to the setting and feeling of three significant historic resources adjacent to the project site. Much of the Draft SEIR’s analysis of impacts on historical resources necessarily focuses on the Beta Theta Pi house, Cloyne Court, Phi Kappa Psi, and Founders’ Rock, as they are the historical resources within or directly adjacent to the proposed project site.

The historic context and background provided in the Draft SEIR on identified historical resources and the surrounding neighborhood are sufficient for analyzing potential project impacts of the proposed project to historical resources. Based on this evidence, page 93 of the Draft SEIR acknowledges that implementation of the Upper Hearst Development Project “would degrade the integrity of feeling and setting of historical resources adjacent to the Project site” and “would contribute to a significant and unavoidable cumulative impact on historical resources.” Implementation of Mitigation Measure CUL-1 would reduce this impact to the extent feasible, but not to a less than significant level, through the inclusion of exterior materials in building design that are more compatible with nearby historical resources. Therefore, the analysis included in the Draft SEIR is sufficient.

Response A 1.2

The commenter states an opinion that contrary to a Project objective to maintain the character of historical resources, the Upper Hearst Development’s design is incompatible with the neighboring historical resources in its height, scale, massing, and exterior materials.

This comment does not conflict with the findings of the Draft SEIR which finds that the design of the two proposed buildings is incompatible with the scale/mass and architectural style and material palette of adjacent historical resources and the surrounding neighborhood. Furthermore, the analysis finds that the designs proposed for the two new buildings do not comply with many of the *Secretary of the Interior’s Standards for Rehabilitation*. The historic context of the neighborhood was a key point in this analysis.

As stated on page 56 of the Draft SEIR, for example:

[T]he scale, massing, and palette of exterior materials at the Upper Hearst Development would not be compatible with neighboring areas of Berkeley. The residential building would be substantially higher and of greater mass than all residential buildings in the site vicinity. Reaching up to 87 feet in height along Hearst Avenue, the residential building would exceed the height of adjacent residential buildings, which are up to four stories tall. The proposed building massing and design also would depart from and compromise the setting of adjacent historic resources that were built in the First Bay Tradition of architecture. These historic buildings are characterized by a purposeful integration within their hillside topography and landscape, the use of indigenous materials and wood shingles, sheathing, and half-timbering, and a relatively low scale and mass, among other features. By contrast, the new buildings would have a contemporary design, primarily consisting of fiber-cement and aluminum panels, plaster, and aluminum-framed and punched (deeply recessed) windows, among other materials.

Based on this incompatibility, the Draft SEIR identifies a significant and unavoidable impact to specific historical resources as well as a cumulative impact on the historic resource base of the neighborhood. The information provided by the commenter does not conflict with the finding presented in the Draft SEIR regarding the design of the proposed buildings and the lack of compatibility of scale/mass and design. Implementation of Mitigation Measure CUL-1 would reduce this impact to the extent feasible through the inclusion of exterior materials in building design that are more compatible with nearby historical resources.

Response A 1.3

The commenter recommends selection of the Reduced Scale Alternative to respect the historic context of buildings that survived Berkeley's 1923 fire near the Project site. The commenter's preference for an alternative instead of the proposed Upper Hearst Development does not conflict with or challenge the adequacy of the Draft SEIR's analysis, but will be forwarded to UC decision-makers for their consideration.

Response A 1.4

The commenter states an opinion that the proposed academic building is too large in scale relative to the adjacent Beta Theta Pi house. This comment does not conflict with the findings of the Draft SEIR, which finds that the proposed academic building adjacent to Beta Theta Pi would be incompatible with the scale/mass and architectural style and material palette of the historical resource. In addition, the Draft SEIR finds that the proposed removal of large segments of the character-defining site setting of the Beta Theta Pi house, including the lawn, circulation patterns, and stream-rock retaining wall, do not comply with the *Secretary's Standards* and would constitute a significant impact to the historic house.

In addition, the Draft SEIR acknowledges that adoption of the Reduced Scale Alternative as described in Section 8, *Alternatives*, which would reduce the scale of proposed buildings on the Project site, would lessen the significant impact to this historical resource, but the impact would remain significant and unavoidable.

Response A 1.5

The commenter asserts that the proposed site plans in figures 5 to 9 of the Draft SEIR and the proposed building sections in Figure 16 show a conflicting number of stories. The Final SEIR has been amended to include a new rendering that shows a five-story residential building on top of three levels of parking, which is the preferred design. In addition, the proposed site plans have been updated to reflect a driveway from La Loma Avenue to the rebuilt Upper Hearst parking structure on the Project site. As discussed in *Thematic Response: Traffic*, the relocated driveway would not result in additional traffic impacts than analyzed in the Draft SEIR. The updated site plans and renderings are included in Section 4 of this Final SEIR document.

Response A 1.6

The commenter asserts that the proposed residential building does not need to be curved around the corner of Hearst and La Loma avenues because this intersection has been reconfigured. As noted by the commenter, the intersection of Hearst and La Loma avenues was recently redesigned, with the southbound right-turn lane from La Loma Avenue to Hearst Avenue removed and converted to landscaping. The proposed Upper Hearst Development includes a portion of the additional area where the right-turn lane was located. At this location, new landscaping and a paved walkway to the residential building's entrance would be installed. In the Final SEIR, Figure 18 in Section 2, *Project Description*, has

been amended to show an updated rendering of the residential building and surrounding landscaping. As indicated by the new rendering, the current design of the residential building would involve a more rectilinear form and less curvature around the intersection's corner than shown in Figure 18 of the Draft SEIR.

Response A 1.7

The commenter provides design recommendations for an Upper Hearst Development that would be more compatible with historical resources, including alternate contemporary exterior materials such as stained concrete and slate shingles, as well as brick or fire-resistant material that replicates wood shingles.

The Draft SEIR includes feasible mitigation to review the palette of exterior materials at the proposed buildings and adjust it if appropriate to become more compatible with nearby historical resources. Accordingly, Mitigation Measure CUL-1 in the Draft SEIR would require that a historic architect meeting the National Park Service's Professional Qualifications Standards for historic architecture review plans for the proposed academic and residential buildings and provide design input prior to approval of final design plans for the Upper Hearst Development. The historic architect shall provide input and refinements to the design team regarding modifications to the palette of exterior materials to improve compatibility with neighboring historical resources and compliance with the *Secretary of the Interior's Standards*. This review shall include, but not be limited to, suggestions for incorporating exterior materials, such as wood or brick, in the design.

Although implementation of Mitigation Measure CUL-1 could improve the compatibility of exterior materials used in the proposed buildings with neighboring historic buildings, the Upper Hearst Development still would have a significant direct and indirect adverse impact on historical resources from removal of character-defining site design features, including a stream-rock retaining wall and brick pathways, at the Beta Theta Pi house and from incompatibility of scale and massing. Therefore, the Draft SEIR acknowledges that this impact on historical resources would remain significant and unavoidable.

Letter A 2

COMMENTER: Tsu-Jae King Liu, Dean and Roy W. Carlson Professor of Engineering,
University of California Berkeley College of Engineering

DATE: March 18, 2019

Response A 2.1

The commenter expresses concern about the loss of parking space on the Project site. Please see *Thematic Response: Parking* for a discussion of parking availability.

Response A 2.2

The commenter asks what the estimated rents would be for each type of proposed residential units. UC Berkeley anticipates that the proposed units would have rents that are at or slightly below market rate. As a result of construction costs, rents must be set to cover the development costs for the project. However, UC Berkeley would continue to work to develop approaches to provide financial relief to certain affiliates, if needed, and is exploring an additional subsidy for faculty living at the proposed residential building. The commenter's questions about rents are acknowledged, but are outside the scope of environmental analysis under CEQA. These questions will be forwarded to UC decision-makers for their consideration.

Response A 2.3

The commenter asks when UC Berkeley will inform the UC Regents and public of the change in the housing plan to house primarily populations other than students and requests the latest financial analysis for the development Project. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of public noticing of the Project and its environmental review. The commenter's request for financial information is acknowledged, but is outside the scope of environmental analysis under CEQA. This question will be forwarded to UC decision-makers for their consideration.

Response A 2.4

The commenter asks if, with the "LRDP addendum," delaying or rejecting the Project would affect future campus development projects. In addition, the commenter asks if this addendum can be separated from consideration of the Upper Hearst Development. It is assumed that the commenter is referring to the updated population baseline analyzed as part of the Draft SEIR. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing this issue along with the Upper Hearst Development in the SEIR.

Response A 2.5

The commenter asks if the campus has conducted a market analysis for the Project's housing component. The commenter's request for financial information is acknowledged, but is outside the scope of environmental analysis under CEQA. This question will be forwarded to UC decision-makers for their consideration.

Response A 2.6

The commenter asks if UC Berkeley has guaranteed a minimum level of occupancy and/or rental income to the developer and, if the number of renters falls below projections, would UC Berkeley be obligated to pay the remaining amount. The commenter also asks what the campus's plan for paying the remaining

amount will be if that is part of the contract. The commenter's questions about financing are acknowledged, but are outside the scope of environmental analysis under CEQA. These questions will be forwarded to UC decision-makers for their consideration.

Response A 2.7

The commenter asks if the Project is being assessed \$9.75 million for the loss of the 390 parking spaces during construction and if it is not, what is the reasoning. For clarification, the proposed Project would result in a net reduction of parking spaces. The commenter's questions about financing are acknowledged, but are outside the scope of environmental analysis under CEQA. These questions will be forwarded to UC decision-makers for their consideration.

Response A 2.8

The commenter asks if the over 200 anticipated construction workers would park at an off-campus site, if their transit time will be counted as paid work time, and if the additional work time is included in the Project's cost estimate. Please refer to *Thematic Response: Parking* for a discussion of parking activity by construction workers. The commenter's questions about cost are acknowledged, but are outside the scope of environmental analysis under CEQA. These questions will be forwarded to UC decision-makers for their consideration.

Response A 2.9

The commenter expresses concern that reduced parking would increase the difficulty of hiring faculty and staff and asks if UC Berkeley has considered the financial cost of higher compensation packages for faculty and staff. Please refer to *Thematic Response: Parking* for a discussion of parking availability. The commenter's financial questions are acknowledged, but are outside the scope of environmental analysis under CEQA. These questions will be forwarded to UC decision-makers for their consideration.

Response A 2.10

The commenter asserts that a reduction in parking would result in some faculty and staff using ride-share services and asks if a study has been conducted that includes an analysis of the increased traffic from ride-share services. Please refer to *Thematic Response: Traffic* for a discussion of the effect of ride-share trips to and from the proposed buildings.

Response A 2.11

The commenter asks if UC Berkeley will halt the practice of reserving parking spaces for conference and special meeting attendees at the Clark Kerr campus. UC Berkeley would not stop reserving Clark Kerr parking spaces and would continue to provide space for conference services. These events typically occur in the summer months when overall peak demand across campus is down so UC Berkeley anticipates that there would be enough parking in other lots on campus to accommodate parking demand during the summer.

Response A 2.12

The commenter states that the campus has only one electric vehicle charging station and asks what UC Berkeley's plan is for installing new electric vehicle chargers. As stated on Page 40 of the Draft SEIR, an estimated 10 parking spaces for electric vehicles would be provided as part of the Project.

Response A 2.13

The commenter asks if UC Berkeley would provide an adequate number of viable parking alternatives before commencing Project construction. Please refer to *Thematic Response: Parking* for a discussion of alternate parking options.

Response A 2.14

The commenter states that the Foothill lot alternative has safety concerns including no sidewalk or lighting along Cyclotron Road and asks if there has been a plan developed for addressing these safety concerns. This comment does not address safety concerns directly related to the proposed Upper Hearst Development and therefore does not question or challenge the adequacy of the Draft SEIR's environmental analysis. Nonetheless, as discussed in *Thematic Response: Parking*, the Foothill lot is one of several alternative parking locations for commuters to campus, and UC Berkeley is currently assessing options to improve pedestrian safety and access to the Foothill parking lot.

Response A 2.15

The commenter states that Lower Hearst parking structure is the closest to the Upper Hearst parking structure and would be the first alternative for people if the Upper Hearst parking structure were demolished. This comment does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response A 2.16

The commenter states that parking at Maxwell Family Field and Stadium garage and the Clark Kerr campus would increase commute time for faculty, staff, and students because they would park further from their destination. The commenter asks if UC Berkeley would provide time-efficient transport from the Clark Kerr campus to the main campus, particularly during commute hours. Please refer to *Thematic Response: Parking* for a discussion of alternate parking options and additional shuttles.

Response A 2.17

The commenter asserts that extra commute time results in less productivity at work and that people would attempt to park in the Lower Hearst lot before the Foothill lot. This comment does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response A 2.18

The commenter asks when UC Berkeley will inform the entire campus community of the need for 390 additional people to park at the Foothill lot, the Maxwell Family Field and Stadium garage, and the Clark Kerr campus, as well as the new shuttle service once construction at the Project site begins. Construction of the Upper Hearst Development is anticipated to begin in early September 2019. The Upper Hearst parking structure would be fenced immediately prior to construction. Once an exact date is identified for closure of the garage, UC Berkeley would roll out a communication plan, which would likely start in August 2019, to notify those that will be affected by the closure and provide alternate parking information.

Response A 2.19

The commenter asks how many parking stalls in the new parking area will be reserved for disabled, the GSPP, the College of Engineering, the EECS Department, and other academic units and research institutes and if the number of reserved parking stalls will be the same in the Upper Hearst parking

structure. The commenter also asks the plan for reserved stalls during the construction period. Please refer to *Thematic Response: Parking* for a discussion of UC Berkeley's plans to reserve parking spaces, insofar as known at this time.

Letter A 3

COMMENTER: David J. Rehnstrom, Manager of Water Distribution Planning, East Bay Municipal Utility District (EBMUD)

DATE: March 18, 2019

Response A 3.1

The commenter states that the Project may be served from both the East Bay Municipal Utility District's (EBMUD's) Santa Barbara Regulated Pressure Zone and the Summit Pressure Zone. Section 16, *Utilities and Service Systems*, on page 173 of the Draft SEIR has been updated in the Final SEIR to read:

The Project site would be served from EBMUD's Santa Barbara Regulated Pressure Zone and the Summit Pressure Zone (Maggiore 2018).

Response A 3.2

The commenter states that any proposed construction activity that may affect the La Loma Regulator located adjacent to the Project site along La Loma Avenue is subject to the terms and conditions determined by EBMUD, including relocation of the facility at the project sponsor's expense. This comment about EBMUD requirements for construction activity does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be noted by UC Berkeley staff for future phases of Project review and implementation.

Response A 3.3

The commenter adds that the Upper Hearst Development is identified as a potential customer to meet the long-term recycled water goal of 2.3 million gallons per day and recommends that a parallel piping system for recycled water be installed and capped for potential cooling tower supply. EBMUD has not provided a timeframe for when the recycled water supply would reach the vicinity of the Project site. The Upper Hearst Development would not include installation of a piping system for recycled water; however, UC Berkeley would continue to coordinate and consult with EBMUD regarding providing recycled water for appropriate non-potable uses.

Response A 3.4

The commenter recommends coordination and consultation with EBMUD regarding providing public recycled water for appropriate non-potable purposes. Please see Response A 3.3.

Letter A 4

COMMENTER: Scott Morgan, Director, State of California Governor's Office of Planning and Research, State Clearinghouse and Planning Unit

DATE: March 19, 2019

Response A 4.1

The commenter confirms that the comment period for the Draft SEIR was extended to April 12, 2019. This comment is acknowledged and has been incorporated into the administrative record. No changes to the SEIR are necessary to address this comment.

Letter A 5

COMMENTER: Jesse Arreguin, Mayor, City of Berkeley

DATE: March 21, 2019

Response A 5.1

The commenter asserts that the increase in UC Berkeley's headcount is inconsistent with the 2020 LRDP's population projections and therefore should be severed from the SEIR. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of rationale for analyzing the updated population baseline as part of the Draft SEIR.

Response A 5.2

The commenter believes that the Draft SEIR is incorrect in concluding that there are no significant impacts that would result from the student population increase because the Draft SEIR studied the increase of population within campus only. As stated on Page 48 of the Draft SEIR, "All answers take account of the whole action involved, including beneficial, direct, indirect, construction-related, operational, and cumulative impacts, based on the checklist questions set forth in Appendix G of the CEQA Guidelines." Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the Draft SEIR's analysis of off-campus environmental impacts resulting from increased enrollment.

Response A 5.3

The commenter asserts that the Project would impact the City of Berkeley with regard to contributing to the regional housing crisis and an increase in homelessness, impacting rental rates for residents and students, increasing utility consumption, increasing demand on public services, and increasing greenhouse gas emissions. The Draft SEIR analyzes the Project's impacts related to utilities, public services, and greenhouse gas emissions, finding less than significant impacts after mitigation. Please also refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the Draft SEIR's analysis of off-campus environmental impacts resulting from increased enrollment.

The suggestion by the City of Berkeley and the commenter that the additional students above those projected in the 2020 LRDP need to be accommodated within the City's boundaries and in turn cause an increase in rents and increased homelessness does not raise a CEQA-required issue and is not supported by the facts. First, some of these students likely already reside in Berkeley. Second, based on the most recent campus surveys, approximately 65 percent of UC Berkeley students actually live on campus or within 1 mile of campus. See UC Undergraduate Experience Survey: Results and Summary, Background 5 (2018), <https://pages.github.berkeley.edu/OPA/surveys/ucues2018.html>. Third, as the campus develops new student housing, students currently renting in Berkeley can move into the student housing, freeing up additional housing stock in the City. The 2020 LRDP EIR assumed that up to 1,192 private market units could become available to UC employees and other non-students as a result of student housing production under the 2020 LRDP.

The housing supply and affordability crisis alluded to in numerous comments is a regional problem that is not unique to the City of Berkeley and is not caused by the increase in the UC Berkeley campus student headcount over the population projected in the 2020 LRDP. The dramatic increase in rental rates that has occurred over the past decade resulting in San Francisco being the most expensive city in the United

States in terms of housing costs has spread to other cities in the Bay Area, including Oakland and Berkeley. The increase in housing and rental costs is attributable to basic supply and demand factors as since 2010 the San Francisco-Oakland-Hayward census area has added approximately seven times as many jobs as residential units. For example, in early 2016, the Bay Area economy had added 480,000 private-sector jobs over the previous five years, but only 50,000 housing units, according to the San Francisco Planning Urban Research Association. Compounding the affordability crisis, San Francisco and the Bay Area have seen a significant influx of high tech companies expanding their headquarters and hiring a large workforce of highly compensated employees. For example, Employment Development Department statistics show that in 2016 roughly 1 in 5 payroll jobs in the Bay Area were in the high-paying high-tech industry. In this greater regional context, the increase in student population at UC Berkeley is likely to have only an insignificant impact on rents within the City of Berkeley because much of the demand is related to San Franciscans and workers new to the area settling in Berkeley and surrounding cities as they are forced out of San Francisco by high rents.

The commenter also suggests, without providing any substantial evidence, that the increase in campus student population puts pressure on public resources by increasing the ratio of police to residents (sic), contributing to an increase in device and laptop crimes, and an increase in ambulance transport demand. Under CEQA, impacts to public services resources are only considered significant if the increased demand would require the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives, which is not the case for any of the impacts alleged by the commenter. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the increase in enrollment and impacts to public services resources.

Similarly, the commenter alleges, without providing any substantial evidence, that the increase in student population over that projected in the 2020 LRDP causes significant impacts within the City of Berkeley related to significant water consumption, waste water, storm water contamination and solid waste. Again, under Appendix G criteria for significance of these impact categories, such impacts would only be considered significant if a project would require or result in the relocation or construction of new or expanded facilities, the construction or relocation of which could cause significant environmental effects.

Response A 5.4

The commenter states that an increase of UC Berkeley's headcount would be detrimental to its relationship with the City of Berkeley and requests that increased headcount be removed from the Project. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of rationale for analyzing the updated population baseline as part of the Draft SEIR and a description of its off-campus environmental impacts.

Letter A 6

COMMENTER: Scott Morgan, Director, State of California Governor's Office of Planning and Research, State Clearinghouse and Planning Unit

DATE: April 8, 2019

Response A 6.1

The commenter confirms that the Draft SEIR was circulated to selected State agencies for review during the public review period and that no State agencies submitted comments before April 5, 2019. This letter also acknowledges that UC Berkeley has complied with the State Clearinghouse review requirements pursuant to CEQA. This comment is acknowledged and has been incorporated into the administrative record. No changes to the EIR are necessary to address this comment.

Letter A 7

COMMENTER: Chris Marks, Associate Transportation Planner, Alameda County Transportation Commission (ACTC)

DATE: April 12, 2019

Response A 7.1

The commenter attaches a letter from ACTC which finds that the proposed Project is exempt from review under the agency's Congestion Management Program because the Project would reduce afternoon (p.m.) peak-hour vehicle trips. This comment does not question or challenge the adequacy of the Draft SEIR's environmental analysis but is acknowledged and will be forwarded to UC decision-makers for their consideration.

Letter A 8

COMMENTER: Timothy Burroughs, Director, Department of Planning & Development, City of Berkeley

DATE: April 12, 2019

Response A 8.1

Several commenters, including the Mayor of the City of Berkeley, have suggested that UC Berkeley should sever the analysis of the increased campus headcount from the Upper Hearst Development project and prepare two separate EIRs. UC Berkeley does not believe that this approach is warranted for several reasons. First, the GSPP SEIR tiers from the 2020 LRDP EIR pursuant to CEQA Guidelines Section 15152. Accordingly, UC Berkeley cannot move forward with the GSPP SEIR and the Upper Hearst Development project without bringing the 2020 LRDP EIR analysis current. Second, pursuant to CEQA Guidelines Section 15125(a), CEQA requires that the environmental impacts of a proposed project be evaluated in the context of existing conditions in the project area at the time that the Notice of Preparation is published, or in the case of the GSPP SEIR, August 15, 2018. Part of that baseline includes the increase in campus headcount over that projected in 2020 and as analyzed in the 2020 LRDP EIR. UC Berkeley cannot evaluate the GSPP project's impacts without utilizing baseline conditions, or by comparing it to hypothetical baseline conditions that do not actually exist, and therefore cannot "sever" the existing population baseline from the analysis of the Upper Hearst Project. That said, the campus uses an updated campus population baseline in the Draft SEIR, and in its environmental analysis of each impact category takes this updated baseline into account and explains how it factors into and/or affects the environmental analysis and significance conclusions reached in both the 2020 LRDP EIR and the GSPP SEIR. Changes in campus population in and of themselves do not constitute a project under CEQA. Environmental effects relating to project changes in enrollment levels are to be considered in the environmental impact report prepared for a long range development plan (see Public Resources Code Section 21080.09(b) and *Thematic Response: Update to 2020 LRDP and 2020 LRDP EIR*), but any discrepancies between the estimated changes in enrollment levels and the actual enrollment levels in subsequent years are not themselves project or program changes that require subsequent CEQA review.

Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of this issue.

Response A 8.2

The commenter states that the Draft SEIR lacks a clear, stable, and finite project description and is inconsistent with the NOP. The NOP and the Draft SEIR indicate that the Draft SEIR analyzes the environmental impacts of the Upper Hearst Development and includes an analysis of the potential impacts of the increased campus headcount above that projected in the 2020 LRDP and analyzed in the 2020 LRDP EIR. Please refer to the responses to Letter ORG 4.1, ORG 4.3, ORG 4.5 and ORG 4.14 from the Southside Neighborhood Consortium. UC Berkeley believes that the Draft SEIR adequately describes the impacts of the proposed Project.

Response A 8.3

The commenter asserts that ignoring the dramatic impact of campus population growth and referring to it as a new "baseline" violates CEQA. The Draft SEIR does not ignore the effects on increasing campus headcount. Please see *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a

discussion of how the Draft SEIR analyzed the environmental impacts of the increase in campus headcount over that projected in the 2020 LRDP in updating its campus headcount baseline. The Draft SEIR does not just assume that the increased headcount is part of the environmental setting and gloss over any potential impacts related to the increased population.

The commenter also asserts incorrectly that “the law specifically requires that the UC Berkeley analyze and mitigate the impacts of such an increase” without specifying which law allegedly requires such a result. Rather, as discussed in *Thematic Response: Update to 2020 LRDP and 2020 LRDP EIR*, Public Resources Code Section 21080.09 specifically requires UC Berkeley to include such analysis in a LRDP EIR, which UC Berkeley will do soon in its upcoming LRDP Update.

Response A 8.4

The comment claims that the Draft SEIR does not analyze all of the potential impacts associated with increase campus population. Draft SEIR Section 4, *Relationship to 2020 LRDP*, clearly explains the ongoing increase in UC Berkeley’s student enrollment, and the environmental document analyzes its impacts throughout. Please also refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the impacts of increased enrollment. As to comments related to how increased student population places additional burdens on already overtaxed city services, while this is a matter of concern, under CEQA, staffing and support needs for public services are relevant only to the extent that they result in physical changes that have environmental impacts. Please refer to *Thematic Response: Fiscal Impacts* for a discussion of this issue.

Response A 8.5

As noted by the City of Berkeley, as a State entity, UC Berkeley is constitutionally exempt from both local regulations and local taxes and development impacts fees. The city requests that UC Berkeley comply with CEQA by paying its fair share to mitigate potential impact caused by its development projects. CEQA Section 15131 states that economic or social effects of a project shall not be treated as significant effects on the environment. Please refer to *Thematic Response: Fiscal Impacts* for a discussion on fiscal impacts. This opinion does not conflict with or challenge the adequacy of the Draft SEIR’s analysis, but is acknowledged and will be forwarded to UC decision-makers for their consideration.

Response A 8.6

The commenter asserts that a fiscal analysis commissioned by the City of Berkeley finds that UC Berkeley’s net fiscal impact on the City has almost doubled to over \$21 million from 2003 to 2018, which directly affects the City’s ability to allocate resources to provide public services. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the increase in enrollment and impacts to public services resources. For a discussion on the matter of payments for city services, please refer to *Thematic Response: Fiscal Impacts*.

Response A 8.7

The City of Berkeley comments that while it supports the proposed Upper Hearst Development in concept, the proposed Project does not respect adjacent historic resources and the Draft SEIR “glosses over” potentially significant noise, archaeological, air quality, and other impacts. For discussion of the Upper Hearst Development’s impacts on cultural resources related to the design and scale of proposed buildings, please refer to the responses to Letter A 1 from the Landmarks Preservation Commission and Letter ORG 1 from the Berkeley Architectural Heritage Association (BAHA). The commenter also does

not provide specific evidence that the Draft SEIR ignores impacts related to noise, archaeological resources, or other issues, so a specific response to this concern is not possible.

Response A 8.8

The commenter asserts that UC Berkeley has dismissed CEQA's requirement to consider public comment and has pre-approved the proposed Project prior to certifying the Final SEIR, in violation of CEQA and CEQA case law. CEQA Guidelines Section 15004(a) provides: "Before granting any approval of a project subject to CEQA, every lead agency or responsible agency shall consider a final EIR or negative declaration or another document authorized by these guidelines to be used in the place of an EIR or negative declaration." CEQA Guidelines Section 15352(a) defines "approval" by public agencies as: "the decision by a public agency which commits the agency to a definite course of action in regard to a project intended to be carried out by any person. The exact date of approval of any project is a matter determined by each public agency according to its rules, regulations, and ordinances. Legislative action in regard to a project often constitutes approval." UC has, pursuant to CEQA Guidelines Sections 15004 and 15352, defined "project approval" as occurring at the time of design approval under its policies (University of California, California Environmental Quality Act Implementation Guidance Frequently Asked Questions, February 14, 2019). The letter from the campus's Director of Physical and Environmental Planning cited by the commenter merely indicates the campus's proposal schedule to bring the Final SEIR to The Regents for certification and to seek design approval of the Upper Hearst Development at the May Regents' meeting. As the approval of the proposed Project has not been delegated to the UC Berkeley Chancellor under The Regents' delegation procedures, only The Regents can approve the Project, which they will decide to do or not to do in their discretion following review of the Final SEIR, including all public comments on the Draft SEIR. The Final SEIR contains the UC Berkeley's responses to all comments received on the Draft SEIR.

Response A 8.9

The commenter asserts that the Draft SEIR violates the minimum standards of adequacy under CEQA and that use of a Supplemental EIR is inappropriate because the Upper Hearst Development and increased enrollment are not consistent with the 2020 LRDP and 2020 LRDP EIR. Please see Response A 8.18 for a discussion of the use of a Supplemental EIR.

Response A 8.10

The commenter asserts that the Draft SEIR contains an unclear and inconsistent project description rendering the Draft SEIR's analysis invalid. Please see *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the Draft SEIR's approach to analyzing the potential environmental impacts of the Upper Hearst Development and the updated campus headcount, and for a discussion of why increases or fluctuations in student enrollment at UC campuses are not a "project" under CEQA.

Response A 8.11

The commenter states an opinion that the increased campus enrollment must be part of the Project and not just an updated baseline and that the Draft SEIR does not use a proper baseline — existing environmental conditions on the ground — to analyze most impacts. Please see *Thematic Response: Environmental Analysis of the Updated Population Baseline* for an explanation of why increases or fluctuations in student enrollment at UC campuses are not considered to be a "project" under CEQA, and for an explanation of how the Draft SEIR's impact analysis accounts for the updated campus headcount baseline.

In addition to ensuring that the environmental analysis of each impact category in Section 6 of the Draft SEIR takes into account the updated campus headcount baseline and explains how the increased campus headcount factors into and/or affects the environmental analysis and significance conclusions reached in the 2020 LRDP Final EIR and Draft SEIR, the impact analyses in Section 6 clearly discuss the environmental setting or CEQA baseline for the Upper Hearst Development under the “Setting” heading, contrary to the commenter’s assertion. Thus, the Draft SEIR uses a proper CEQA baseline while at the same time not ignoring any potential impacts that could result from the increase in campus headcount by merely assuming that the increased headcount was merely part of the setting. The Draft SEIR impact analysis appropriately evaluates whether impacts would fall within the scope of the analysis in the 2020 LRDP EIR because the Draft SEIR is a Supplemental EIR, but in doing so it also analyzes the impacts of the Upper Hearst Development in relation to existing conditions.

Response A 8.12

The commenter opines that the Draft SEIR does not provide an adequate description of the location, capacity, and function of proposed bioretention areas. All bioretention areas would be located within the respective property lines of the Project site. At the academic building, bioretention areas would be located at the upper courtyard and at sidewalk level within the property line. At the residential building, the majority of bioretention would occur at the inner courtyards, with small areas on the Hearst and La Loma Avenue frontages, all located within the property line. The stormwater control plan would be submitted for review by the consulting engineers to the City of Berkeley.

Response A 8.13

The commenter states an opinion that the Draft SEIR should include a Construction Management Plan. As noted in the Draft SEIR, Continuing Best Practices TRA-3-a, TRA-3-b, and TRA-3-c describe measures for reducing or minimizing traffic impacts during construction. Adherence to these best practices would address potential impacts related to construction traffic, which would be temporary in nature. Impacts related to construction traffic would be less than significant and no mitigation is therefore required. The commenter does not provide information or analysis to suggest that construction traffic impacts would be significant. Neither CEQA Statute nor the CEQA Guidelines require inclusion of a Construction Management Plan in EIRs.

In addition, UC Berkeley works with the City of Berkeley to develop construction management and routing plans. UC Berkeley staff met with City of Berkeley Department of Public Works staff on April 4, 2019, to discuss, among other things, construction transportation management and routing for the Project. Public Works Department stated that a Construction Transportation Management Plan (TMP) must be completed before construction begins and is to include notification and coordination of the work and traffic impacts on the public right-of-way with the neighboring properties, residences, businesses, and the city. UC Berkeley would attain an approved TMP prior to project commencement. The comment does not address a significant environmental impact, and no further response is required in accordance with CEQA.

Response A 8.14

The City of Berkeley notes that the Draft SEIR provides no details on events that could be held in the proposed academic building. Please refer to *Thematic Response: Proposed GSPP Events Space* for further discussion of this space. The comment does not address a significant environmental impact, and no further response is required in accordance with CEQA.

Response A 8.15

The writer comments that the Draft SEIR does not provide information on the dewatering process to be used during construction of the Project. Prior to pursuing dewatering operations, UC Berkeley would need to determine if dewatering is required. Preliminary geotechnical explorations, including borings and cone penetration tests on the site to date, have not provided a definitive determination if dewatering would be required at the time of excavation. UC Berkeley would survey existing groundwater conditions with piezometer readings within one or two months prior to commencing excavation to determine if groundwater would be expected to be encountered.

If dewatering is required, drilling wells would be placed at strategic locations for monitoring groundwater level, flow rate, and water quality. Preliminary readings and the monitoring of wells would help determine the design of the dewatering system. The wells would also serve as the interface where the groundwater is pumped (to drawdown the ground level to below bottom of excavations) and piped away from the excavation and into the filtering system. Any groundwater from dewatering would be filtered prior to discharge into the City of Berkeley's storm sewer or EBMUD's sanitary system. Water quality would be tested from samples to determine the type(s) of filtrations required, ranging from sediment separation for clean water to more sophisticated filtration systems for contaminated groundwater. Sampling of the groundwater would continue routinely during the entire dewatering operations as required, which would continue until the basement structure is constructed and water tight. The dewatering operations described above, if necessary, would be temporary and intended for construction only. A permanent dewatering system would not be required.

Response A 8.16

The commenter contends that Draft SEIR Mitigation Measure CUL-1 may result in Project redesign, does not include specific Project changes to address impacts, and therefore defers mitigation. However, consistent with the comment as it relates to lack of specificity in the mitigation measure, this mitigation measure is not relied on in the Draft SEIR to reduce impacts to a less than significant level. As stated on Page 93 of the Draft SEIR, the impact would remain significant and unavoidable. As discussed therein, the significant and unavoidable impact on historical resources would be within the scope of the 2020 LRDP EIR's analysis, which found that new development to further UC Berkeley's educational mission could alter historical resources in a manner not consistent with the *Secretary's Standards*, resulting in a significant and unavoidable impact.

Response A 8.17

The commenter asserts that the GSPP SEIR cannot tier its analysis of either the Upper Hearst Development or population projections because neither element is consistent with the 2020 LRDP EIR, as enrollment has exceeded projections contained in the 2020 LRDP EIR, which renders it inappropriate for purposes of tiering. The CEQA Guidelines encourage the use of tiered environmental documents to eliminate repetitive discussion of the same issues. CEQA Guidelines Section 15152(b) states, "Tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy, or program to an EIR or negative declaration for another plan, policy or program of lesser scope, or to a site-specific EIR or negative declaration." The 2020 LRDP EIR indicated that projects implementing the 2020 LRDP would be examined to determine whether subsequent project-specific environmental documents are required. (See 2020 LRDP EIR Vol I page 1-2). UC Berkeley thus examined the Upper Hearst Development project for consistency with the program as described in the 2020 LRDP and with the environmental impact analysis contained in the 2020 LRDP EIR to determine if new environmental impacts would occur, or if new mitigation measures would be required. The tiered GSPP SEIR thus

provides a project-specific environmental analysis to determine if the proposed Project would result in any significant impacts not adequately addressed in the 2020 LRDP EIR and/or if additional mitigation measures beyond those adopted in the MMRP for the 2020 LRDP EIR would be required to reduce impacts to a less than significant level.

Enrollment exceeding projections contained in the 2020 LRDP EIR does not render tiering inappropriate. Despite the growth in campus headcount over 2020 LRDP projections, which has led to the new campus headcount baseline, the analysis in the GSPP SEIR shows that the campus is still operating within the envelope of capacities and demands for resources such as housing, water, electricity, public services, and others that were analyzed in the 2020 LRDP Final EIR. At the end of 2018, approximately 955,160 gsf of new 2020 LRDP developed space had been constructed or was under construction on the campus out of the 2.2 million gsf of development projected in the 2020 LRDP and analyzed in the 2020 LRDP Final EIR for year 2020. This is only 43 percent of the projected development total; well within the envelope of the 2020 LRDP despite enrollment exceeding projections contained in the 2020 LRDP EIR. Therefore, most of the environmental analysis in the 2020 LRDP EIR remains valid and usable for tiering purposes. UC Berkeley has appropriately incorporated information from the 2020 LRDP EIR in the Draft SEIR under CEQA's tiering standards.

Response A 8.18

The commenter suggests that UC Berkeley should have prepared a Subsequent EIR, not a Supplemental EIR. Pursuant to CEQA Guidelines Section 15162(a), no Subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

- (1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
- (2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
- (3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:
 - (A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
 - (B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
 - (C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
 - (D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Pursuant to CEQA Guidelines Section 15163(a), a lead agency may prepare a Supplemental EIR rather than a Subsequent EIR if:

- (1) Any of the conditions described in Section 15162 would require the preparation of a subsequent EIR, and
- (2) Only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation.

Both forms of EIR require the same level of public notice and circulation. A Subsequent EIR is a stand-alone document. A Supplemental EIR is reviewed with the earlier EIR that it supplements, but it may be circulated by itself without recirculating the previous draft or final EIR pursuant to CEQA Guidelines Section 15163(d).

In the case of the GSPP SEIR, UC Berkeley was supplementing information contained in the 2020 LRDP EIR, as stated in the Introduction of the Draft SEIR.

The purpose of an EIR is provide information to the public and the decision makers as to the potential environmental consequences of a proposed project. That is what the Draft SEIR does. Whether the document is titled as a Supplemental EIR or a Subsequent EIR would not change the level of environmental analysis of the Upper Hearst Development project or the consideration of the increased campus headcount, nor would it change the level of public circulation and review.

Response A 8.19

The City of Berkeley comments on the inadequacy of the Draft SEIR because it would induce substantial growth in the city without a plan to provide adequate housing, placing a significant burden on the city to develop housing units. Although the comment does not address a significant environmental impact under CEQA, a further response is included.

UC Berkeley approves development projects based upon environmental documents that tier off the 2020 LRDP EIR. However, the student population has now increased beyond 2020 LRDP projections with little or no analysis of the potential environmental impacts of this increase in students over the number analyzed in the 2020 LRDP EIR. CEQA requires that UC Berkeley compare the potential impacts of a housing project, such as the Upper Hearst Development, with existing environmental conditions at the time CEQA review occurs, including current campus population. It is by comparing the project with these baseline physical conditions that the campus can determine whether an impact is significant.

Review of population increases are typically done as part of an overall LRDP and its EIR. However, the next LRDP and its associated EIR have just begun a multi-year planning and public engagement process. Therefore in order for UC Berkeley to entitle any new housing projects, which will improve housing conditions overall both for UC Berkeley affiliates and for the city at large, UC Berkeley must bring the current 2020 LRDP and associated EIR to a new population baseline with the current campus population.

While the proposed Project would construct up to 225 residential beds, UC Berkeley has embarked on an in-depth process to construct additional student housing. Given the UC Berkeley's limited resources and its high standards for student housing development, this process does take time. In the interim, UC Berkeley has engaged in master leases in order to ensure that its students are able to find housing, and to grow a culture of UC Berkeley housing that ensures success after the construction of new student

housing. While providing new student housing is an urgent priority, UC Berkeley must build responsibly, given the public nature of the campus. Master leases are a part of an interim solution, and are not considered long-term by any of the parties involved.

The proposed Project has three main goals related to housing:

1. Increase the number of Housing units for UC Berkeley affiliates
2. Provide better access to housing for ladder faculty
3. Provide academic space to support GSPP

The housing portion of the Project would have a direct impact on the shortage of available units both in the city and for campus constituents. The shortage of available housing for UC Berkeley's students and untenured ladder faculty is a matter of urgent concern for UC Berkeley. This lack of campus housing capacity adversely impacts the overall student experience and challenges the UC Berkeley's ability to recruit and retain faculty, graduate students, and post-docs.

Response A 8.20

The City of Berkeley states that the Draft SEIR provides no data on current and anticipated housing stock or data concerning homeless students, and does not analyze how increased campus population would contribute to higher housing insecurity to both students and residents. CEQA was enacted to protect the environment and speculation about increased housing insecurity is beyond its scope. The comment does not address a significant environmental impact, and no further response is required in accordance with CEQA. Nonetheless, please refer to *Thematic Response: Housing* for a discussion of the effect of increased enrollment on displacement of existing tenants in private off-campus housing.

Response A 8.21

The commenter states an opinion that the Draft SEIR provides no information about the ramifications of a reduced police service ratio and fails to evaluate the impacts of relying more heavily on the City's police department to fill the gap in services or potential changes in response times due to the increased service population. The Draft SEIR acknowledges that UC Berkeley's police department (UCPD) currently fails to meet service ratio goals. The commenter speculates that UCPD staffing influences Berkeley Police Department's service demand. While this concern is acknowledged, under CEQA, staffing, support and equipment needs for public services are relevant only to the extent that they result in physical changes that have environmental impacts. Pursuant to Appendix G of the CEQA Guidelines, the relevant CEQA question is whether the Project would "Result in the need for new or physically altered police facilities, the construction of which could cause significant environmental impacts." The commenter does not provide information or analysis to suggest that new or physically altered police facilities, the construction of which could cause significant environmental impacts, would be required as a result of the proposed Project or increased headcount. Therefore, as discussed in Section 6 of the Draft SEIR under Item 13, Public Services, impacts would be less than significant. It should also be noted that UC Berkeley (Intercollegiate Athletics) contracts with the City of Berkeley annually to provide police and emergency response services, parking enforcement, special event signage and trash pick-up adjacent to Memorial Stadium. In fiscal year 2017-2018, Intercollegiate Athletics budgeted \$302,600 for these services. Please also refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the Draft SEIR's analysis of increased enrollment on public services.

Response A 8.22

The commenter remarks on the perceived adequacy on staffing levels and fiscal impacts on the City's fire and emergency services as a result of increased campus enrollment. Please refer to *Thematic Response: Fiscal Impacts* for a discussion on fiscal impacts. While this concern is acknowledged, under CEQA, staffing, support and equipment needs for public services are relevant only to the extent that they result in physical changes that have environmental impacts. Pursuant to Appendix G of the CEQA Guidelines, the relevant CEQA question is whether the Project would "Result in the need for new or physically altered fire or emergency medical services facilities, the construction of which could cause significant environmental impacts." The commenter does not provide information or analysis to suggest that new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, would be required as a result of the proposed Project or increased headcount. Therefore, as discussed in Section 6 of the Draft SEIR under Item 13, Public Services, impacts would be less than significant.

Response A 8.23

The City of Berkeley accurately asserts that the City's Health, Housing and Community Services Department is responsible for the public health aspect, such as database entry, tracking, investigations, and notifications, of legally reportable communicable diseases and that UC Berkeley students contribute a significant proportion of cases. It is also true that the City of Berkeley's Public Health jurisdictional rates are one of the highest in the nation, outpacing not just California but Alameda County as well. University Health Services staff continues to work in partnership with city public health staff to discuss monitoring and disease control. Because UC Berkeley students represent a significant proportion of the cases, University Health Services prioritizes outreach and work related to diseases such as tuberculosis and sexually transmitted diseases. However, the comment does not address a significant environmental impact, and no further response is required in accordance with CEQA. Please refer to *Thematic Response: Fiscal Impacts* for a discussion of this issue.

Response A 8.24

The City of Berkeley prepared a fiscal impact study in 2003 and attached to its comments on the Draft SEIR an updated study. Please refer to *Thematic Response: Fiscal Impacts* for a discussion of this issue.

Response A 8.25

The City of Berkeley asserts that the Draft SEIR's estimates of trip generation from Campus Park are flawed because they are based solely on student commute surveys, rather than on empirical data. However, as described in the UC Berkeley Long Range Development Plan Trip Generation Comparison Memorandum (Appendix G to the Draft SEIR) separate surveys of multiple population groups on campus (undergraduate students, graduate students, faculty, and staff) were used to estimate the trip generation from Campus Park. These surveys included questions about mode share, which were used to estimate trip generation for each population group. As shown in Appendix G to the Draft SEIR, the drive-alone mode share for all population groups decreased from 2001-2002 to 2017-2018.

Directly counting all the traffic generated by Campus Park is not feasible because UC Berkeley provides numerous parking structures dispersed throughout the campus and surrounding areas. In addition, some motorists to Campus Park use non-UC Berkeley parking facilities or on-street parking. The parking demand generated by the Campus Park at the non-UC Berkeley parking facilities or on-street parking cannot be isolated as these facilities can be used by the general public. Since it is not feasible to directly

measure the Campus Park trip generation, the trip generation is estimated based on the results of the commute surveys of the various population groups.

Further, as described in Appendix G to the Draft SEIR, the decrease in trip generation and drive-alone mode share between 2001-2002 and 2017-2018 are consistent with the following trends:

- A 15 percent decrease in the parking inventory operated by UC Berkeley
- A 2 percent decrease in the number of parking permits issues by UC Berkeley, despite an increase in population
- Currently, all of the parking lots within or adjacent to Campus Park have occupancy rates above 90 percent
- An 11 percent decrease in AM peak hour and 16 percent decrease in PM peak hour total intersection volume at intersections throughout the City.

Therefore, the Draft SEIR has an adequate basis for relying on population surveys to estimate trip generation from Campus Park

The commenter further asserts that the Draft SEIR fails to provide adequate details about the commute surveys prepared for the traffic analysis, including the survey questions and sample size, and ignores non-student commuters. As discussed above, the surveys covered multiple population groups on campus (undergraduate students, graduate students, faculty, and staff), and respondents were asked questions about mode share. The table below summarizes the response rate for the various surveyed population groups on campus.

	Survey Response Rate				
	Undergrad	Grad	Faculty	Staff	Overall
Completed	953 (12.9%)	1682 (25.7%)	817 (27.2%)	2734 (43.0%)	6,186 (26.5%)
Sample	7,397	6,556	3,008	6,360	23,321

The response to commute surveys to multiple on-campus populations was adequate to estimate mode share and thereby estimate trip generation to Campus Park.

The commenter also asserts that the Draft SEIR provides no evidence that increases in non-automotive travel would reduce parking demand from the Upper Hearst Development. The commenter also speculates that reduced parking supply could result in higher parking demand elsewhere, but does not provide evidence in support of this assertion. Please note that parking availability in itself is not an environmental issue that warrants analysis under CEQA. Therefore, the Draft SEIR does not include an analysis of the Upper Hearst Development's effects on parking demand or occupancy. Refer to *Thematic Response: Parking* for further discussion of parking availability.

The commenter also claims that a reduction on UC Berkeley parking permits does not support the finding in Table 19 of the Draft SEIR that increased campus headcount would result in fewer vehicle trips. As shown in the Draft SEIR (Table 19 and Appendix G), the UC Berkeley-operated parking supply decreased by about 1,130 spaces (about 15 percent) from 2001-2002 to 2016-2017, and during the same period, the drive-alone mode share for all population groups, as well as Campus Park trip generation, decreased. This is one of several factors that have contributed to a decrease in trip generation over this time frame.

Other factors include an increase in students living within walking distance of Campus Park, UC Berkeley's expanded Transportation Demand Management program to increase non-automobile mode shares, and improvements in pedestrian and bicycle facilities. Therefore, despite increased student enrollment, it is estimated that trip generation to and from Campus Park would not exceed that assumed in the 2020 LRDP EIR.

As stated in the comment, the Draft SEIR presents data that shows current traffic volumes (2015-2018) are lower than the existing (2002) traffic volumes or the forecasted (2020) volumes used in the 2020 LRDP EIR at studied intersections throughout the City of Berkeley. The Draft SEIR does not state that the decrease in traffic volumes is solely due to the decrease in drive-alone mode share and the resulting decrease in trip generation. As stated in the comment, various factors, including ones not related to the Campus Park trip generation, may contribute to the decrease in traffic volumes. The Draft SEIR presents the decrease in traffic volumes, because as described above, the Campus Park trip generation cannot be directly measured, and the intersection volume comparison is used to show that the decrease in observed intersection traffic volumes is consistent with the estimated Campus Park trip generation, which further validates the trip generation estimate.

Response A 8.26

The commenter maintains that the Draft SEIR is flawed because it does not analyze construction-related traffic impacts. Please see Response A 8.13 for a response to this comment.

Response A 8.27

The commenter cites the City of Berkeley Guidelines for Development of Traffic Impact Reports to contend that the Draft SEIR should analyze existing pedestrian and bicycle travel paths and mitigate any potential impacts to pedestrian and bicycle facilities. However, as discussed on page 134 of the Draft SEIR, UC Berkeley is not subject to local governments' regulations, including those of the City of Berkeley. Therefore, the City's guidelines for traffic studies are not applicable to the Draft SEIR which analyzes a proposed UC Berkeley project. As determined on page 170 of the Draft SEIR, the Upper Hearst Development would be within the scope of the 2020 LRDP EIR's analysis of pedestrian and bicycle facilities and would have a less than significant impact.

Response A 8.28

The commenter contends that the Draft SEIR does not adequately analyze or mitigate the Project's consistency with the most recent Clean Air Plan, especially in light of the fact that the new development would be located in a zone not previously identified in the 2020 LRDP. As discussed on page 64 in the Draft SEIR, the 2020 LRDP EIR found that with implementation of the mitigation measures and coordinated planning efforts with the BAAQMD, "future projects implementing the 2020 LRDP would likely be in compliance with air quality plans (2020 LRDP EIR Vol 1, p. 4.2-28 to 4.2-29)." Consistent with this finding, the Draft SEIR note that UC Berkeley would continue to implement Mitigation Measure AIR-5 and Continuing Best Practice AIR-5 in the 2020 LRDP EIR. This would ensure that campus growth is accurately addressed in the Clean Air Plan, and that UC Berkeley would continue to develop and implement transportation control measures. Furthermore, the Draft SEIR explains that the Upper Hearst Development would not exceed UC Berkeley's overall growth in student beds or physical facilities as anticipated in the 2020 LRDP. Therefore, the Upper Hearst Development would be within the scope of the 2020 LRDP EIR's analysis of consistency with clean air plans and would not conflict with the 2017 Clean Air Plan. No further analysis or mitigation is required.

The commenter also asserts that the Draft SEIR should rely on the Bay Area Air Quality Management District's (BAAQMD) CEQA Guidelines in evaluating the Project's consistency with the Clean Air Plan. However, the Draft SEIR is an environmental document that tiers off the 2020 LRDP EIR and relies on its analysis to determine environmental impacts where appropriate. As discussed above, the Project would be within the scope of the 2020 LRDP EIR's air quality analysis and therefore would have a less than significant impact related to consistency with clean air plans with its mitigation measures incorporated. The commenter does not present specific evidence that the Project could be inconsistent with clean air plans based on the BAAQMD's CEQA Guidelines. Therefore, no further analysis is required.

Response A 8.29

The commenter contends that the Draft SEIR is inadequate because it ignores the exposure of new sensitive receptors on the Project site to pollutant concentrations and does not apply the BAAQMD's screening tools to determine the risk levels of stationary sources within 1,000 feet of a Project site. However, the siting of receptors in proximity to permitted or non-permitted sources of toxic air contaminants (TACs) or PM_{2.5} emissions would not be considered a significant impact under CEQA, since this would be an effect of the environment on the Project. Based on a California Supreme Court decision in December 2015 (*CBIA v. BAAQMD*), a CEQA document need only analyze the impacts of a project on the environment, not the effects that the existing environment may have on a project unless the project would exacerbate an existing significant impact, which the Project would not. Therefore, no additional analysis of this issue is required.

Response A 8.30

The commenter claims that Draft SEIR's analysis of cumulative air quality impacts is deficient because it ignores emissions for increased student enrollment, including mobile emissions from commuters to campus. However, as discussed on page 63 of the Draft SEIR, increased student enrollment would not require additional physical development beyond that anticipated in the 2020 LRDP EIR and therefore would not result in additional emissions associated with physical facilities. In addition, the Draft SEIR finds that increased student enrollment would not result in greater vehicle trips than projected in the 2020 LRDP EIR. As a result, mobile emissions from people commuting to and from campus would not exceed levels anticipated in the 2020 LRDP EIR, and increased enrollment would not result in new significant cumulative air quality impacts.

The commenter states that the Draft SEIR's modeling of air pollutant emissions from the Upper Hearst Development fails to account for construction of the parking structure. In response to this comment, the modeling results using the CalEEMod program have been revised in the Final SEIR to include construction of this feature. Table 6 in the Draft SEIR, showing estimated construction emissions from the Upper Hearst Development, has been revised as follows:

**Table 6:
Maximum Daily On-Site and Off-Site
Construction Air Pollutant Emissions**

	Emissions (lbs/day)			
	ROG	NO _x	Exhaust PM ₁₀	Exhaust PM _{2.5}
2019	2.3	22.7	1.3	1.2
2020	3.29	22.94.5	0.8	0.8
2021	2.87	21.049.7	0.7	0.7
Maximum lbs/day¹	3.29	22.94.5	1.3	1.2
<i>BAAQMD Thresholds</i>	54	54	82	54
Threshold Exceeded?	No	No	No	No

¹ Maximum daily on and off-site emissions based on highest day in any construction year, i.e. 2019, 2020, or 2021.

Source: CalEEMod; see Appendix C for calculations.

As shown in the revised Table 6, including construction of the parking structure in the modeling of air pollutant emissions does not substantially alter the results, and maximum daily emissions would still not exceed applicable BAAQMD thresholds for criteria air pollutants. Therefore, the Draft SEIR's finding that the Upper Hearst Development would have a less than significant impact from construction emissions remains valid. The updated modeling results do not apply to operational emissions because the new development would include a smaller parking structure with less parking activity than under existing conditions.

The commenter also claims that the Draft SEIR incorrectly assumes a reduction in vehicle trips due to the Project, which results in an inaccurate estimate of operational emissions. However, the commenter does not present any evidence here that the Draft SEIR's traffic analysis is inadequate. As discussed on page 66 of the Draft SEIR, "operational emissions would not considerably contribute to the significant and unavoidable impact identified in the 2020 LRDP EIR from development under the 2020 LRDP." Please refer to *Thematic Response: Traffic* and Response IND 124.3 for further discussion of the adequacy of the trip generation estimates for the Upper Hearst Development.

Response A 8.31

The commenter asserts that the Draft SEIR is inadequate because it fails to analyze the exposure of new occupants on the Project site to TACs from stationary sources like Lawrence Berkeley Laboratory. Please refer to Response A 8.29 for a discussion of this issue.

In addition, the commenter contends that the Draft SEIR should analyze the exposure of sensitive receptors to airborne particulates from construction of the Project, consistent with BAAQMD's 2017 CEQA Guidelines. Please refer to Response A 8.30 for a discussion of criteria air pollutants generated by construction of the Project, including airborne particulates. As explained therein, construction emissions from the Project would not exceed applicable BAAQMD thresholds and would have a less than significant impact on sensitive receptors.

Response A 8.32

The commenter contends that the Draft SEIR greenhouse gas analysis is incomplete because it underrepresents traffic-related impacts, improperly calculates service population, and avoids analysis potential impacts by relying on Project features to mitigate Project-related impacts.

The commenter states an opinion that the Draft SEIR underestimates traffic generated by the Upper Hearst Development, which would result in underestimating greenhouse gas emissions. However, the commenter does not present any evidence here that the Draft SEIR's traffic analysis is inadequate. Please refer to *Thematic Response: Traffic* and Response IND 124.3 for further discussion of the adequacy of the trip generation estimates for the Upper Hearst Development.

The commenter also asserts that the Draft SEIR's analysis of greenhouse gas emissions does not define the term "service population" consistent with the BAAQMD CEQA Guidelines, in that only resident students should be counted. The Draft SEIR estimates UC Berkeley's greenhouse gas emissions per service population for informational purposes only, as part of a discussion of the existing setting. For the purpose of evaluating the Project's impacts on climate change, the impact analysis relies on consistency with applicable regulatory standards (e.g., AB 32 and the UC system's Carbon Neutrality Initiative) rather than efficiency thresholds based on service population. Furthermore, the Draft SEIR acknowledges that the Project and increased campus headcount would have a potentially significant impact on climate change, which requires implementation of Mitigation Measure GHG-1 to reduce to a less-than-significant level.

In addition, the commenter asserts that the proposed development is not within parameters of 2020 LRDP, so its greenhouse gas emissions would be additional. However, as discussed globally in the Draft SEIR, the proposed academic space and student beds would not be additional to the 2020 LRDP's development parameters, considering UC Berkeley's remaining development capacity under this long-range plan.

The commenter also claims that the Draft SEIR wrongly relies on Project's design features to mitigate impacts. However, the Draft SEIR considers design features as one of many factors in evaluating impacts on climate change. As discussed above, the document requires mitigation to reduce the Project's impact to a less-than-significant level.

Response A 8.33

The commenter asserts that without a quantitative analysis of Project-related greenhouse gas emissions in the Draft SEIR, it is impossible to determine amount of carbon offsets or renewable energy certificates that would be needed to mitigation the Project's emissions. However, as discussed on page 113 of the Draft SEIR, it does not analyze the Project's emissions in isolation; instead, these emissions are considered in combination with those from increased campus headcount. Therefore, Mitigation Measure GHG-1's requirement to purchase carbon offsets or renewable energy certificates, if necessary, applies to UC Berkeley's emissions as a whole. Quantifying emissions generated by the Upper Hearst Development in particular is not necessary to establish the amount of campus-wide emissions for which offsets would be required. Furthermore, as discussed in the Draft SEIR, UC Berkeley conducts annual inventories of its greenhouse gas emissions, which would be adequate for determining the amount of offsets or renewable energy certificates.

The commenter also cites studies that carbon offset programs may not achieve desired reductions in emissions. Although it is acknowledged that different offset programs have achieved varying results, the California Air Resources Board's offset program has a history of successfully mitigating emissions in-state. Mitigation Measure GHG-1 would require the purchase of in-state offsets or renewable energy certificates, which would be based on California projects and would reduce statewide emissions. Furthermore, the commenter does not present specific evidence that UC Berkeley's offset program would be ineffective. Therefore, Mitigation Measure GHG-1 would be adequate for the purpose of reducing emissions.

In addition, the commenter claims that the Draft SEIR's mitigation approach is counter to the California Air Resources Board's recommendation to offset emission locally. Because this approach is a recommendation and not a requirement for in-state projects, UC Berkeley is not bound to offset emissions on the Project site or within the City of Berkeley.

The commenter also asserts that the Draft SEIR fails to analyze consistency with the City of Berkeley's Climate Action Plan. However, UC Berkeley is constitutionally exempt from local land use regulation and planning. Therefore, the City's Climate Action Plan is not applicable to UC Berkeley projects.

Response A 8.34

The commenter claims that the Draft SEIR's noise measurements are misleading because they were taken during peak-hour traffic and not during nighttime and morning hours. However, it is the industry standard among acoustical consultants to take ambient noise measurements during peak-hour traffic conditions, to characterize the worst daily noise exposure near a Project site. It is also a more conservative approach to assume that new residents on the Project site would be exposed to this noise level. Therefore, it is appropriate for the Draft SEIR to rely on peak-hour noise measurements in its noise analysis.

The commenter also opines that the Draft SEIR's threshold of 65 dBA for daytime exterior noise is not based on any City or UC Berkeley policy. Please refer to Response A 8.33 for a discussion of UC Berkeley's exemption from local land use regulation.

In addition, the commenter contends that the Draft SEIR fails to provide adequate detail about the operational noise from proposed outdoor use spaces and HVAC equipment. However, see response to ORG 4.11 regarding noise generated from outdoor use spaces. The commenter does not present evidence that the requested additional information is necessary or would alter the Draft SEIR's determination of a less-than-significant impact from on-site operational noise.

Response A 8.35

The commenter claims that Mitigation Measure NOI-5 from the 2020 LRDP EIR only applies to pile driving and therefore would not effectively mitigation vibration from construction of the Project. However, pages 147 and 148 of the Draft SEIR specifically address this issue, stating:

Although this measure was written to apply specifically to the use of pile drivers in construction, portions of the measure are also appropriate for the proposed Upper Hearst Development because of its use of vibration-generating equipment and its close proximity to historic structures. Applicable elements of Mitigation Measure NOI-5 would involve conducting a pre-construction survey to address the susceptibility ratings of structures and soil conditions; and monitoring vibration if necessary during construction.

Consistent with the 2020 LRDP EIR's analysis, implementation of this measure would reduce the potential impact from vibration on structures to less than significant.

Therefore, the Draft SEIR requires implementation of Mitigation Measure NOI-5 in such a way as to effectively mitigate vibration from construction activities at the Project site.

Response A 8.36

The commenter claims that the Draft SEIR's method for estimating noise levels from the Project is inconsistent with the City's municipal code. However, as discussed in Response A 8.33 and globally in the Draft SEIR, UC Berkeley is exempt from local land use regulation. Therefore, the Draft SEIR does not need to adhere to methodology in the City of Berkeley Municipal Code in estimating noise levels.

Response A 8.37

The commenter asserts that the Draft SEIR fails to incorporate recommended measures in the Salter's Noise Study for the Upper Hearst Development. However, page 145 of the Draft SEIR requires the inclusion of such measures, as follows:

To reduce interior noise at the academic building to an acceptable level of 50 dBA Leq, the Noise Study recommends installation of windows with Sound Transmission Class (STC) ratings of up to 36. For the residential building to meet the Title 24 standard of 45 dBA Ldn, the Noise Study also specifies minimum recommended STC ratings for windows and doors. Implementation of Mitigation Measure NOI-3 in the 2020 LRDP EIR would ensure compliance with building standards that reduce noise impacts to building occupants, which would involve the inclusion of Project-specific building features recommended by the Noise Study. Therefore, the impact from the exposure of new residents and building occupants to ambient noise would be less than significant.

Response A 8.38

The commenter contends that the Draft SEIR's land use analysis ignores the impact on inconsistencies with the City's land use standards. As discussed therein, UC Berkeley is exempt from local land use regulation. Nonetheless, the Draft SEIR acknowledges that the Upper Hearst Development would be inconsistent with Continuing Best Practice LU-2-c to minimize incompatibilities with targeted densities in the City of Berkeley General Plan and with local zoning standards for height and setbacks. Because of this land use inconsistency, the Draft SEIR determines that the Project would have a new significant and unavoidable impact related to land use, which is beyond that anticipated in the 2020 LRDP EIR.

Response A 8.39

The commenter asserts that UC Berkeley fails to identify other inconsistencies with City code related to affordable housing and child care, historic resources, and other issues. As discussed above, UC Berkeley is exempt from and does not need to maintain consistency with local land use regulation. Nonetheless, the Draft SEIR acknowledges a significant and unavoidable impact from inconsistency with 2020 LRDP policy to minimize land use incompatibilities.

Response A 8.40

The City of Berkeley asserts that while the Draft SEIR acknowledges increased student enrollment it does not plan for or provide housing or address associated impacts. Draft SEIR Section 4, *Relationship to 2020 LRDP*, clearly explains the ongoing increase in UC Berkeley's student enrollment, and the environmental

document analyzes its impacts throughout. Please also refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the impacts of increased enrollment. Moreover, the proposed Project would construct up to 225 residential beds for campus affiliates and approval of the this SEIR would enable UC Berkeley to entitle future development projects that would provide housing for students, improving housing conditions overall both for UC Berkeley affiliates and the city.

Response A 8.41

The commenter asserts that the Draft SEIR fails to adequately describe existing conditions at the Project site related to cultural resources. Please see Response A 1.1 for a response to this comment.

Response A 8.42

The commenter asserts that the Draft SEIR does not adequately identify the likelihood of the presence of archaeological resources at the Project site, including remains of Newman Hall/Holy Spirit Parish as well as potentially older resources. Contrary to this comment, sensitivity of the site specifically related to potential remnants of Newman Hall/Holy Spirit Parish is discussed in Section 6 of the Draft SEIR under Item 5, Cultural Resources. As discussed therein, impacts would be less than significant with required adherence to mitigation measures in the 2020 LRDP EIR.

Response A 8.43

The City maintains that the mitigation measures for cultural resources identified 2020 LRDP EIR, which would apply to the proposed Project, would not adequately protect archaeological resources in the event they are encountered only during construction. However, in the event that such resources are discovered on the Project site during construction, 2020 LRDP Continuing Best Practice CUL-4-a requires that the site be investigated by a qualified expert and that any unique resources be protected. Please also see Response A 8.42.

Response A 8.44

The commenter claims that the Draft SEIR is flawed because it defers mitigation of impacts associated with historic resources. Please see Response A 8.16 for a response to this comment.

The commenter further states an opinion that the Draft SEIR's mitigation measure to address potential vibration impacts on adjacent structures is inadequate. Please refer to Response A 8.35 for a response to this comment.

Response A 8.45

The commenter states an opinion that the Draft SEIR's treatment of hydrology and water quality impacts is flawed because although neither the proposed Project nor increased headcount would result in physical construction beyond what was projected in the 2020 LRDP EIR, the increased headcount would result in indirect impacts associated with construction of new housing elsewhere in the city to accommodate the increase in the number of students. The commenter does not provide information or analysis on the amount or location of new housing built by others to accommodate increased enrollment or how significant hydrology or water quality impacts would result on which to base a specific response. As discussed in *Thematic Response: Housing*, the increased student enrollment could result in some increased construction of new housing stock in the City of Berkeley, but all such housing would be subject to existing regional and City water quality regulations. Also discussed in Section 6 of the Draft SEIR under Item 9, Hydrology and Water Quality, impacts would be less than significant. Please see also *Thematic Response: Environmental Analysis of the Updated Population Baseline*.

Response A 8.46

The commenter claims that the Draft SEIR is flawed because it does not describe the existing hydrologic setting and water quality status associated with Strawberry Creek. The commenter does not provide information or analysis to suggest that the project would result in water quality or hydrology impacts to Strawberry Creek or any other water body. Strawberry Creek is over 1,000 feet from the project site and separated by topographic variations, buildings and landscaped areas. As discussed in Section 6 of the Draft SEIR under Item 9, Hydrology and Water Quality, impacts related to hydrology and water quality would be less than significant with required adherence to existing regulations and campus policies/standard procedures, including Continuing Best Practice HYD-4-e to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions..

Response A 8.47

The commenter asserts that the increased headcount associated with the Project results in indirect impacts to off-site infrastructure, specifically with regard to storm drains and sewers and the City's stormwater infrastructure. As discussed in Response A 5.4, under Appendix G of the CEQA Guidelines, impacts to off-site infrastructure, including storm water facilities, are only considered significant if require or result in the relocation or construction of new or expanded facilities, the construction or relocation of which would cause significant environmental effects. Contrary to the commenter's assertion, the Draft SEIR at pages 126-128 does describe project features, including compliance with State-wide NPDES Construction General Permit (Order 2009-0009-DWQ), preparation of a SWPPP, compliance with UC Berkeley's Wastewater Quality Program, preparation of a Stormwater Management Report, and implementation of numerous Hydrology Continuing Best Practices contained in the 2020 LRDP EIR. CEQA does not require that a Stormwater Management Report, SWPPP, or other documents customarily generated to comply with various federal, national or local regulations be included in an EIR. The commenter's suggestion that increased housing in high density areas of the City, some of which could be occupied by UC Berkeley students, could lead to an increase in maintenance for the City's stormwater system, but this does not rise to the level of a significant impact under CEQA.

The commenter also contends that the Draft SEIR violates CEQA by relying solely on best management practices and UC Berkeley's Best Practices, which fail to ensure that no impacts would result. Contrary to the commenter's assertion, UC Berkeley is not relying solely on Hydrology continuing best practices to address impacts to stormwater infrastructure, but rather on the combined procedures outlined above. UC Berkeley uses continuing best practices and mitigation measures that are the subject of its ongoing Mitigation Monitoring Program. The commenter's assertion that UC Berkeley cannot rely upon the continuing best practices contained in the 2020 LRDP EIR is incorrect.

Response A 8.48

The commenter asserts that the Draft SEIR fails to provide any environmental analysis of project-related impacts associated with dewatering during construction. Please refer to Response A 8.15 for a discussion of dewatering.

Response A 8.49

The commenter claims that the Draft SEIR's description of existing wastewater conveyance infrastructure around the Project site is inadequate. However, the Draft SEIR's analysis of wastewater impacts on page 178 acknowledges that such infrastructure requires repair. Mitigation Measure UTIL-1 in the Draft SEIR requires that existing wastewater collection systems serving the Project site be rehabilitated and replaced.

With implementation of this measure, the Project would not exacerbate existing burdens on the wastewater conveyance system, and impacts would be less than significant.

Response A 8.50

The commenter asserts that the Draft SEIR's analysis of growth-inducing impacts is inadequate because it is not supported by substantial evidence. The commenter also indicates that the Draft SEIR ignores the fact that UC Berkeley's increased enrollment will necessitate development of housing in the City of Berkeley and other nearby communities. As stated throughout the Final SEIR, CEQA requires that impacts related to increases in student enrollment at UC campuses be analyzed in connection with each campus's preparation of a LRDP. Please see discussions in *Thematic Response: Update to 2020 LRDP and 2020 LRDP EIR* and *Thematic Response: Environmental Analysis of the Updated Population Baseline*. Nonetheless, the Draft SEIR does include a discussion of potential growth-inducing impacts of the increased campus headcount even though that increase is not the project in the Draft SEIR. See Draft SEIR at pages 148-152 and page 186 describing the potential growth-inducing impacts on the private housing market in the City of Berkeley and nearby communities. To the extent that increases in population may tax existing community service facilities, the analysis of utilities and infrastructure contained in the Draft SEIR does not demonstrate that any such increased demand would necessitate the construction of new facilities that in turn could cause significant effects.

Response A 8.51

The commenter asserts that the Draft SEIR's cumulative impacts analysis is inadequate because it is limited to the GSPP component of the Project and does not consider the impacts of the GSPP Project in combination with the increased enrollment. For the impact categories related to physical development, the increased enrollment is not relevant as described in *Thematic Response: Environmental Analysis of the Updated Population Baseline*. The analysis in the GSPP SEIR shows that the campus is still operating within the envelope of capacities and demands for resources such as housing, water, electricity, public services, and others that were analyzed in the 2020 LRDP Final EIR. At the end of 2018, approximately 955,160 gsf of new 2020 LRDP developed space had been constructed or was under construction on the campus out of the 2.2 million gsf of development projected in the 2020 LRDP and analyzed in the 2020 LRDP Final EIR for year 2020. This is only 43 percent of the projected development total. For the impact categories that are population driven, like utilities or public services, the Draft SEIR's discussion of the population increase is incorporated with the environmental analysis for the GSPP project.

The commenter also states that the list of reasonably foreseeable future projects consider in the SEIR are under-inclusive, and that the Draft SEIR should have looked at cumulative impacts citywide. The Draft SEIR's cumulative impact analysis only includes the current projects that are located near the GSPP component of the Project. Furthermore, the commenter does not provide any specific analysis or information to support a conclusion that there would be any significant cumulative impact.

Response A 8.52

The commenter asserts that the Draft SEIR does not comply with the requirements of CEQA because it fails to undertake a legally sufficient study of alternatives to the Project. See Response ORG 2.1, ORG 4.26 and IND 128.1 for a discussion of the Project Alternatives in the Draft SEIR. The commenter states that the Draft SEIR fails to disclose the severity of the Project's wide-ranging impacts or to accurately describe the Project which thus distorts analysis of the Project's alternatives, therefore failing CEQA's requirements. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for an explanation of the Draft SEIR's approach to the analysis of environmental impacts.

The commenter also indicates that the Draft SEIR fails to consider any alternative that addresses the significant impacts associated with the enrollment increase of the Project and the housing demands that increase generates. CEQA Guidelines Section 15126.6 requires an EIR to describe a range of reasonable alternatives to the Project. See *Thematic Response: Environmental Analysis of the Updated Population Baseline* for an explanation of why the increase in student enrollment is not a “project” under CEQA. As a result, the Draft SEIR analyzes a range of reasonable alternatives to the Upper Hearst Development.

The commenter implies that the Project objectives are impermissibly narrow in violation of CEQA. CEQA Guidelines Section 15124(b) requires the Project Description to include “a statement of the objectives sought by the proposed project.” The list of Project objectives contained in Section 3.4 of the Draft SEIR does just that; they are comprehensive and generally broad in nature. If the commenter is suggesting that the objectives are too narrow because they do not focus on the increase in student enrollment, that increase is not a project under CEQA.

Response A 8.53

The commenter asserts that an agency cannot approve a proposed project if a feasible alternative exists that would meet most of the project’s objectives and avoid significant impacts. Please refer to Response A 8.52 for a discussion on alternatives. The alternatives in the Draft SEIR were selected to avoid or reduce the Project’s significant impacts to aesthetics, cultural resources, land use, and noise, as required by CEQA.

Response A 8.54

The commenter urges UC Berkeley to revise and recirculate the environmental analysis in two separate Subsequent EIRs that do not tier from the 2020 LRDP EIR. Please see *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of why UC Berkeley does not believe that it is appropriate under CEQA to sever the environmental analysis of the Upper Hearst Development from the increase in campus headcount. Please see Response to Comment A 8.17 for a discussion of why UC Berkeley believes that it is appropriate to tier the Draft SEIR from the 2020 LRDP EIR.

Regarding the comment that recirculation is required, CEQA Guidelines Section 15088.5(a) provides: “A lead agency is required to recirculate an EIR when significant new information is added to the EIR after public notice is given of the availability of the draft EIR for public review under Section 15087 but before certification New information added to an EIR is not “significant” unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (including a feasible project alternative) that the project’s proponents have declined to implement.” CEQA Guidelines Section 15088.5(b) provides: “Recirculation is not required where the new information added to the EIR merely clarifies or amplifies or makes insignificant modifications in an adequate EIR.”

Here, the comments on the Draft SEIR and information provided in these responses to comments in the Final SEIR do not disclose significant new information meeting the standards for recirculation under CEQA Guidelines Section 15088.5.

Letter A 9

COMMENTER: Scott Morgan, Director, State of California Governor's Office of Planning and Research, State Clearinghouse and Planning Unit

DATE: April 15, 2019

Response A 9.1

The commenter states that no State agencies submitted comments on the Draft SEIR before closure of the extended public review on April 12, 2019. This letter also acknowledges that UC Berkeley has complied with the State Clearinghouse review requirements pursuant to CEQA. This comment is acknowledged and has been incorporated into the administrative record. No changes to the EIR are necessary to address this comment.

Letter ORG 1

COMMENTER: Carrie Olson, Corporate Secretary, Berkeley Architectural Heritage Association (BAHA)

DATE: March 11, 2019

Response ORG 1.1

The commenter contends that the Draft SEIR's analysis of cultural resources is inadequate because it relies on few, outdated sources and does not consult the BAHA website's discussion of historical resources in Northside Berkeley. In addition, the commenter states an opinion that the Draft SEIR ignores many designated or eligible historic buildings and structures near the Project site, including a number of buildings and structures in Daley's Scenic Park that survived the 1923 Berkeley Fire. The commenter includes a map of such fire-surviving structures.

The purpose of the Draft SEIR's analysis of cultural resources is to identify, disclose, and mitigate/avoid/lessen potential direct and indirect impacts that could result from project implementation. In keeping with standard CEQA and professional practice, the Draft SEIR's historical resources analysis considers any potential historical resources within or directly adjacent to the Project site. In addition, the Draft SEIR includes a historic context of the surrounding neighborhood such that potential significant adverse indirect impacts or cumulative impacts to adjacent historical resources could be analyzed and disclosed.

The information provided by the commenter does not include evidence conflicting with that presented in the Draft SEIR regarding the historic significance of the subject properties and the surrounding neighborhood. The fact that Daley's Scenic Tract is a highly significant area of the North Berkeley Hills is not in dispute and is consistent with the information presented in the Draft SEIR. Please refer to Response A1.2 for a detailed discussion of the Draft SEIR's thorough review of the Project site's historic context in Northside Berkeley, including consultation of sources associated with BAHA. As stated there, the Draft SEIR provides an adequate description of this historic context.

Response ORG 1.2

The commenter states that the University of California's past actions resulted in the demolition of three historic structures on the Project site:

- College Hall at 2627 Hearst Avenue
- Newman Hall at 2630 Ridge Road
- Phi Kappa Psi Chapter House No. 2 at 2625 Hearst Avenue

The commenter adds that two nearby historic structures (the Alpha Kappa Lambda Chapter House and the Hansen House) were lost for similar reasons. The commenter includes photographs of all five demolished historic structures. In keeping with standard CEQA and professional practice, the Draft SEIR analysis identifies extant cultural resources within or immediately adjacent to the Project site because these would be directly affected by new development on-site. Please note that the Project site is not situated in a designated historic district, which would require analysis of the Project's effects across the entirety of such an area. In addition, the Draft SEIR describes the most relevant historic context of the surrounding neighborhood in order to ensure that resources are evaluated within their historic context

and that any potential indirect impacts or cumulative impacts to historical resources could be analyzed and disclosed.

Although the three historic structures listed above are not extant on the Project site and do not contribute to its present-day historic context, Page 94 of the Draft SEIR does note the former location of Newman Hall within an area of the Project site where excavation and new construction would occur. The Draft SEIR describes Newman Hall as the Roman Catholic student center associated with UC Berkeley that occupied the site from roughly 1905 through the 1960s. The archaeological resources analysis of the Draft SEIR also acknowledges the possibility that structural remnants or historic refuse related to this property might be extant on-site, beneath the present-day asphalt parking lot. Continuing Best Practice CUL-4 of the 2020 LRDP EIR includes requirements for the study, documentation, and management of any historical resource or archaeological resource discovered on the project site. Therefore, the Draft SEIR's discussion of the historic context on the Project site and its analysis of potential archaeological impacts associated with former on-site buildings are sufficient.

The commenter also asserts that previously demolished historical buildings on and near the Project site could provide inspiration for an Upper Hearst Development that is designed in a manner compatible with the neighborhood. This opinion does not conflict with or challenge the adequacy of the Draft SEIR's analysis, but is acknowledged and will be forwarded to UC decision-makers for their consideration.

Response ORG 1.3

The commenter provides a list of structures in the vicinity of the Project site that survived the 1923 Berkeley Fire. In keeping with standard CEQA and professional practice, the Draft SEIR's historical resources analysis adequately addresses potential historical resources within or directly adjacent to the Project site. In addition, the Draft SEIR describes the historic context of the surrounding neighborhood such that potential significant direct and indirect impacts and cumulative impacts could be analyzed and disclosed. The Draft SEIR acknowledges potential significant adverse impacts to three historical resources as well as significant cumulative impacts to the historical resource base throughout the neighborhood. Therefore, the Draft SEIR's discussion of the Project site's historic context is sufficient.

Response ORG 1.4

The commenter writes that the Draft SEIR stops short of "addressing the neighborhood's historical resources in the vicinity of the project site." As discussed in the above responses, the Draft SEIR provides an adequate discussion of the historic context for the purpose of analyzing and disclosing the Project's impacts on historical resources. This analysis identifies not only a direct significant impact to historical resources but also a significant indirect impact through a change to the integrity of setting and feeling of three historical resources. Furthermore, it also identifies a significant cumulative impact to the surrounding neighborhood as a result of the Project. Implementation of Mitigation Measure CUL-1 would reduce this impact to the extent feasible, but not to a less than significant level, through the inclusion of exterior materials in building design that are more compatible with nearby historical resources. Therefore, the analysis included in the Draft SEIR is sufficient.

The commenter also opines that the design for the two proposed buildings shows a "total lack of sensitivity" for the surrounding historic neighborhood. The Draft SEIR acknowledges that the design of the two proposed buildings is incompatible with the scale/mass and architectural style of the adjacent historical resources and surrounding neighborhood. Furthermore, the analysis finds that the proposed

building designs do not comply with many of the *Secretary of the Interior's Standards for Rehabilitation*. The historic context of the neighborhood was a key point in this analysis.

As stated on Page 56 of the Draft SEIR, for example:

[T]he scale, massing, and palette of exterior materials at the Upper Hearst Development would not be compatible with neighboring areas of Berkeley. The residential building would be substantially higher and of greater mass than all residential buildings in the site vicinity. Reaching up to 87 feet in height along Hearst Avenue, the residential building would exceed the height of adjacent residential buildings, which are up to four stories tall. The proposed building massing and design also would depart from and compromise the setting of adjacent historic resources that were built in the First Bay Tradition of architecture. These historic buildings are characterized by a purposeful integration within their hillside topography and landscape, the use of indigenous materials and wood shingles, sheathing, and half-timbering, and a relatively low scale and mass, among other features. By contrast, the new buildings would have a contemporary design, primarily consisting of fiber-cement and aluminum panels, plaster, and aluminum-framed and punched (deeply recessed) windows, among other materials.

Based on this incompatibility, the Draft SEIR identifies potential significant adverse impacts to three historical resources as well as a cumulative impact on the historic resource base of the neighborhood. The information provided by the commenter does not conflict with the finding presented in the Draft SEIR regarding the design of the proposed buildings and the lack of compatibility of scale/mass and design. Implementation of Mitigation Measure CUL-1 would reduce this impact to the extent feasible, but not to a less than significant level, through the inclusion of exterior materials in building design that are more compatible with nearby historical resources.

Response ORG 1.5

The commenter criticizes the proposed buildings as “too massive, too tall, too inharmonious with nearby historic resources, and too insensitive to the adjacent historic neighborhood.” Please refer to Response 17.4 above. This comment does not conflict with the findings presented in the Draft SEIR regarding the lack of compatibility of scale/size, mass, and architectural style and materials and the potential for significant indirect adverse impacts due to this lack of compatibility.

In terms of compatible in-fill construction, Page 78 of the Draft SEIR describes relatively successful and contextual examples of infill construction, such as UC Berkeley’s Foothill Student Housing building, in the northeast corner of the intersection of Hearst and La Loma avenues. The analysis notes that the wood-shingle cladding, relatively low height, roof features, U-shape plan, and architectural detailing of the building allow it to blend in with the character and setting of the Arts and Crafts buildings of the neighborhood.

Response ORG 1.6

The commenter states an opinion that a five-story residential building would still be too tall and massive for the surrounding neighborhood. The commenter adds that no new building on the Project site should exceed the height of the adjacent Foothill housing complex. Section 2, *Project Description*, in the Draft SEIR makes a conservative assumption that the proposed residential building would be up to six stories in height above grade. Under this assumption, the Draft SEIR finds significant and unavoidable impacts

related to aesthetics and historical resources, due in part to the incompatible scale and massing of the residential building with the surrounding neighborhood. The commenter's opinion about the preferred scale of new buildings on-site will be forwarded to UC decision-makers for their consideration.

Response ORG 1.7

The commenter expresses support for the Academic Building Only Alternative with a two-story building, provided that its design reflects greater sensitivity to the historic context. This opinion does not conflict with or challenge the adequacy of the Draft SEIR's analysis, but will be forwarded to UC decision-makers for their consideration.

Response ORG 1.8

The commenter also expresses support of the Reduced Scale Alternative, provided that the design of new buildings reflects greater sensitivity to the historic context. This opinion does not conflict with or challenge the adequacy of the Draft SEIR's analysis, but will be forwarded to UC decision-makers for their consideration.

Letter ORG 2

COMMENTER: UC Berkeley College of Engineering Ad-Hoc Committee for Review of GSPP Development Project

DATE: March 19, 2019

Response ORG 2.1

The commenters express concern that there was not enough project outreach for stakeholders within the UC Berkeley community and that there are not enough Project alternatives that compensate for the loss of parking in the northeast section of campus. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of noticing to the UC Berkeley community.

Per Section 15126.6 of the CEQA Guidelines, an EIR must examine a range of reasonable project alternatives that would feasibly meet most of the basic project objectives, but would avoid or significantly lessen impacts. There is no prescribed rule dictating the selection of alternatives other than the rule of reason. An EIR is also not required to analyze every possible alternative to a project, rather it must explore a reasonable range to encourage informed decision making.

Draft SEIR Section 8, *Alternatives*, was prepared in accordance with Section 15126.6 of the CEQA Guidelines and discusses the Project objectives. The Project alternatives were developed to address those resource topics which would be subject to significant impacts, specifically aesthetics, cultural resources, land use, and noise. The four alternatives examined in Section 8 were developed for their potential feasibility, ability to achieve most of the project objectives, and ability to reduce significant environmental impacts. Also note that because parking availability in itself is not an environmental impact under CEQA, a lack of parking would not represent a significant environmental impact that alternatives need to reduce.

Response ORG 2.2

The commenters opine that there was not enough project transparency, consultation, and communication about the Project with College of Engineering faculty and staff. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of noticing to the UC Berkeley community.

Response ORG 2.3

The commenters state an opinion that there should have been more consideration for parking dislocation and increased commute time for UC Berkeley employees. Please refer to *Thematic Response: Parking* for a discussion of parking availability. The commenters' opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response ORG 2.4

The commenters believe that the Project misrepresents the intent of the UC Berkeley community, UC Board of Regents, and the public. This comment about the Project's merits does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response ORG 2.5

The commenters opine that there was not adequate consultation and collaboration about the Project with UC Berkeley's College of Engineering faculty and staff and that the GSPP needs should not dictate the use of space that serves a larger community. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of noticing to the UC Berkeley community. The opinion about the appropriate use of space does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response ORG 2.6

The commenters state an opinion that parking will be impacted at the northeast portion of the campus because the Project would result in a permanent loss of 310 parking spaces. It is anticipated that the Project would result in the net reduction of 174 parking stalls, not 310. Please refer to *Thematic Response: Parking* for a discussion of parking availability.

Response ORG 2.7

The commenters state an opinion that the long-term parking solution proposed as part of the Project has not undergone sufficient analysis because all three alternative parking areas barely constitute 310 parking stalls to make up for the removal of parking stalls in the Upper Hearst lot. It is anticipated that the Project would result in the net reduction of 174 parking stalls, not 310. The commenters state that the Foothill lot and Clark Kerr lots are generally full and that additional shuttles and cars looking for parking would increase greenhouse gas emissions. Please refer to *Thematic Response: Parking* for a discussion of parking availability, substitute parking options, and technological solutions to reduce the circulation of vehicles searching to parking.

Response ORG 2.8

The commenters assert that UC Berkeley employees would not have readily available access to alternative modes of transportation because many employees do not live near campus and need their personal vehicles to travel to other places after work. The commenters believe that the cost in parking and the cost of additional personal time for transportation to campus is unacceptable treatment of UC Berkeley faculty and staff. This opinion about accessibility to campus does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response ORG 2.9

The commenters assert that the proposed student housing would not be affordable for most students and that a market analysis should be provided to show that there is community demand for faculty, visiting scholars, and graduate student housing. The commenter states that faculty, visiting scholars, and graduate student housing was not the original intent of the project and the economic viability and benefit to the campus should be analyzed for the project. These comments about the Project's intent and affordability do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response ORG 2.10

The commenters request a meeting with UC Berkeley staff involved in the project during regular business hours before April 20th and that the Academic Senate formally review the entire Project. In response to this comment and related concerns, the Chancellor met with College of Engineering faculty the afternoon of April 12, 2019, and again on April 22, 2019, for a town hall meeting.

Letter ORG 3

COMMENTER: Associated Students, University of California Berkeley

DATE: March 21, 2019

Response ORG 3.1

The commenters assert that UC Berkeley needs to build additional campus housing to accommodate the increase in enrollment. Please refer to *Thematic Response: Housing* for a discussion of the need for housing.

Response ORG 3.2

The commenters state that UC Berkeley should provide additional emergency services and safety features on the campus because additional enrollment could result in the need for increased emergency services and the Fire Department and ambulance services does not have enough resources to accommodate the enrollment growth. Please also refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline*, *Thematic Response: Fiscal Impacts*, and Response A 8.22.

Section 6 of the Draft SEIR under Item 13, Public Services, discusses public services needs for the Project, including those needs related to the updated campus headcount baseline. As discussed on page 157 of the Draft SEIR:

“The Upper Hearst Development and ... the increase in UC Berkeley’s existing and projected headcount would not require additional physical development beyond that planned for in the 2020 LRDP. Therefore, it would not increase the number of structures that require fire protection. However, it would increase the service population for fire protection. Measures prescribed in the 2020 LRDP EIR that would be applicable to fire services include continuing the campus partnership with LBNL, the Alameda County Fire Department station at LBNL, and the City of Berkeley to ensure adequate fire and emergency service levels (Continuing Best Practice PUB-2.3).

Although emergency service providers may have to increase staffing to serve an increased student population, the Draft SEIR finds that with implementation of Continuing Best Practice PUB-2.3, it is expected that “an increased headcount would not result in the need for new or physically altered fire or emergency medical services facilities.”

With regard to policy service, page 156 of the Draft SEIR states:

“the UCPD’s goal for “service ratios is 1.6 officers per 1,000 campus population. Based on the projected campus headcount of 62,090 for the 2022-2023 school year, and assuming the current status of 68 sworn officers, the ratio would be 1.1 officers per 1,000 campus population. Although the department is not currently meeting its stated goal and would continue not to meet the goal, the UCPD is able to serve UC Berkeley’s existing and projected headcount with its existing physical facilities. UCPD also has no plans for facility expansion. Therefore, no physical environmental impacts from the increase in the campus headcount would occur.”

As discussed on page 157 of the Draft SEIR, even if the construction of new public service facilities is required to serve additional students, “The 2020 LRDP EIR found that... these facilities are not anticipated to have significant cumulative environmental impacts (2020 LRDP EIR Vol 1, p. 4.11-32).”

For further discussion of the environmental impacts of increased enrollment, please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline*.

Response ORG 3.3

The commenters express concern about the increase in campus headcount, asserting that the housing near campus is inadequate for students, which results in longer commutes and increased traffic and emissions impacts. The commenters request funding for bus improvements and bike lanes and recommend electrifying the campus to reduce emissions.

As discussed in the Draft SEIR’s traffic analysis, it is projected that increased enrollment beyond the level anticipated in the 2020 LRDP would not result in additional vehicle trips and traffic congestion. Please refer to *Thematic Response: Traffic* for further discussion of traffic impacts. Pages 39 and 40 in Section 3, *Project Description*, of the Draft SEIR describe energy efficiency and green facility measures of the Project. The Upper Hearst Development would achieve a minimum LEED Silver rating and would include low-emitting adhesives, sealants, composite wood, agrifiber products, paints, and coatings; Forest Stewardship Council-certified wood; and low-flow plumbing fixtures. The Upper Hearst Development would be consistent with the University of California’s Green Building goals because the academic building would have an all-electric system and would not use on-site fossil fuel combustion for space and water heating. In addition, the Upper Hearst Development would provide 40 spaces of secure bicycle parking in level P3 (street level) of the parking structure, six unsecured spaces for bicycles (providing space for 12 bicycles total) on level P2 of the parking structure, for a total of 52 total spaces in the garage, as well as additional bicycle racks on the street to promote bicycle transportation. The commenters’ recommendation to electrify the campus is consistent with the framework of the UC Sustainable Practices Policy, as summarized on pages 110 and 111 of the Draft SEIR, which UC Berkeley will continue to implement to reduce greenhouse gas emissions from building operations.

Letter ORG 4

COMMENTER: Southside Neighborhood Consortium

DATE: April 12, 2019

Response ORG 4.1

The commenter asserts that the Project Description is not clear as to whether the increased campus headcount is the baseline because its discussion is included in the “environmental setting” rather than the “project description” so that the reader is left guessing as to whether the Draft SEIR actually evaluates the environmental impacts of increased student enrollment over the increase projected in the 2020 LRDP EIR. As indicated in Draft SEIR Section 1.1, *Project Summary*, and Chapter 4, *Relationship to 2020 LRDP*, the environmental analysis of each impact category in Section 6 of the Draft SEIR takes into account the updated campus headcount baseline and explains how the increased campus headcount factors into and/or affects the environmental analysis and significance conclusions reached in the Final 2020 LRDP EIR and the GSPP SEIR. This approach is explained in greater detail in each section of Chapter 6 in an introduction to the impact analysis titled “Approach to Campus Headcount Baseline Update” and in the impact analysis as pertinent. Contrary to the commenter’s assertion, a review of each introductory section of each impact category makes it clear that the updated campus headcount baseline is not merely assumed to be the environmental setting for the Draft SEIR, as each introductory section addresses Setting, 2020 LRDP & LRDP EIR, Mitigation Measures and Continuing Best Practices, and Approach to Campus Headcount Baseline Update.

The increase in UC student enrollment over the past two decades is primarily the result of statewide population growth, leading to an increase in college-aged Californians and high school graduation rates. The California Master Plan for Higher Education calls for UC to admit all qualified freshman in the top 12.5 percent of California high school graduates, as well as all qualified California Community College transfer students. Freshman applicants in particular have risen dramatically over the past two decades, growing five to six percent per year, and more than tripling since 1994. Of note, between 2010 and 2015, freshman applications grew by 58 percent. Similarly, transfer applicants have almost doubled over the last 20 years. In fall 2015, there were approximately 158,000 freshman applicants and 36,000 transfer applicants. To ensure that UC was appropriately accommodating this growth, the State Legislature’s 2015-16 Budget Act tied a significant portion of UC’s funding to evidence that it had increased the number of resident students by at least 5,000. In response, UC increased enrollment of California residents at UC campuses by a total of 10,000 full-time equivalent (FTE) students over the next three academic years, beginning in 2016-17.¹

Response ORG 4.2

The commenter states that the Project Summary in the Draft SEIR is highly misleading and materially deficient by not completely quantifying the scope of the project, particularly as it relates to the increased student enrollment, even though other “elements of UCB’s proposed project are described in great detail.” The commenter also suggests that the increased student population described in the Draft SEIR violates the 2020 LRDP. CEQA Guidelines Section 15123 provides that a Draft EIR shall contain a brief summary of the proposed actions and their consequences, including an identification of each significant

¹ See UC’s Accountability Report 2016, available at: <https://accountability.universityofcalifornia.edu/2016/chapters/chapter-1.html#1.1.1> (last referenced April 30, 2019).

effect with proposed mitigation measures and alternatives, areas of controversy known to the Lead Agency, and issues to be resolved including the choice among alternatives and whether and how to mitigate the significant environmental effects. Draft SEIR Section 1, *Executive Summary*, satisfies the requirements of Guidelines Section 15123. Contrary to the commenter's assertion, it devotes equal attention (two paragraphs each) to the description of the Upper Hearst Development and to the updated campus population baseline/increased student enrollment. It describes significant environmental effects of the proposed Project, applicable mitigation measures, project alternatives, areas of controversy and issues to be resolved.

As noted on page 45 of the Draft SEIR, the campus population projections contained in a campus LRDP are simply projections; they do not constitute a cap on enrollment growth. Therefore, the increase in campus student enrollment above that projected in the 2020 LRDP does not constitute a "violation" of the 2020 LRDP.

Response ORG 4.3

The commenter suggests that the Draft SEIR's Project Description is deficient because it does not address population increase, which must be presented as a major element of the Project. The commenter also suggests that the increase in student enrollment requires a major amendment to the 2020 LRDP. In addition, the commenter asserts that UC Berkeley is attempting to hide a major increase in student enrollment from the City of Berkeley and its residents by treating the increase as part of the environmental setting or updated campus population baseline. Please see Response ORG 4.1 for a summary of the Draft SEIR's treatment of the increased campus headcount. UC Berkeley has not hidden the student enrollment increase. It is clearly stated throughout the Draft SEIR, including in the Executive Summary, Introduction, Project Description, Relationship to 2020 LRDP and Environmental Evaluation chapters of the Draft SEIR. Table 4 of the Draft SEIR also provides a quantitative comparison of the updated population projections to both existing conditions and the 2020 LRDP EIR's projections. Furthermore, the environmental analysis of each impact category in Section 6 of the Draft SEIR takes into account the updated campus baseline and explains how the updated campus headcount factors into and/or affects the environmental analysis and significance conclusions reached in the 2020 LRDP EIR and the Draft SEIR.

Student enrollment increases do not require major amendments to the 2020 LRDP. Student enrollment is addressed at the campus level in periodic campus land use plans or LRDPs, as required by Public Resources Code Section 21080.09.

As to the analysis of potential impacts on the City environs resulting from any increase in student enrollment, please see *Thematic Response: Environmental Analysis of the Updated Population Baseline*.

Response ORG 4.4

The commenter expresses support for the housing component of the proposed Project but requests that the environmental analysis under CEQA for that project be separated from the evaluation of campus population. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing both elements in the Draft SEIR.

Response ORG 4.5

The commenter states an opinion that preparation of a Supplemental EIR rather than Subsequent EIR is inappropriate because the project is inconsistent with the 2020 LRDP EIR. Please refer to Response A 8.9 for discussion of this issue.

The commenter also states that because the Project Description is deficient by not describing the increase in student enrollment as a major amendment to the 2020 LRDP, UC Berkeley has provided materially deficient notices to the public regarding the SEIR process. Please refer to Response ORG 4.3 regarding the Project description and the lack of need to amend the 2020 LRDP. Please also see *Thematic Response: Noticing and Consultation* regarding the adequacy of noticing to the public.

Response ORG 4.6

The commenter states that Draft SEIR *Table 1: Summary of Significant and Unavoidable Impacts* is deficient because it does not address potential issues related to population growth. Draft SEIR Section 4, *Relationship to 2020 LRDP*, clearly explains the ongoing increase in UC Berkeley's student enrollment, and the environmental document analyzes its impacts throughout, stating on page 45:

The environmental analysis of each impact category in Section 6 of this SEIR takes into account the updated campus headcount baseline and explains how the increased campus headcount factors into and/or affects the environmental analysis and significance conclusions reached in the 2020 LRDP Final EIR and this SEIR. For some impact categories, such as Aesthetics, Cultural Resources, Land Use, and Tribal Cultural Resources, the analysis of whether the increased headcount causes environmental impacts hinges on physical development. For other impact categories, such as Air Quality, GHG Emissions, Noise, Population, Public Services, and Transportation and Traffic, the analysis of whether the increased headcount causes environmental impacts hinges on population numbers on the campus. The introductory section of each impact category section will explain the approach taken to accounting for the increased campus headcount in that section and how the increase in campus headcount factors into the impact analysis.

Response ORG 4.7

The commenter asserts that an enrollment increase as described in the Draft SEIR requires the preparation of a Subsequent EIR rather than a Supplemental EIR. Please refer to Response A 8.18 for a discussion of this issue. Although population growth, in and of itself, is not an environmental impact, the Draft SEIR analyzes the various environmental impacts that may result from such growth. As discussed in Response ORG 4.1, this analysis in the Draft SEIR is adequate for the purpose characterizing the potential impacts of an updated campus population baseline.

In its future preparation of UC Berkeley's next LRDP, the EIR for this LRDP could include an alternative for reduced student enrollment, similar to the alternatives analyzed as a part of the 2020 LRDP EIR, although such an alternative is neither required by UC policy or CEQA..

Response ORG 4.8

The commenter asserts that page 7 of the Draft SEIR lacks a complete discussion of all subsequent environmental documents. It is assumed that this comment refers to prior environmental documents that have tiered off the 2020 LRDP EIR. Draft SEIR Section 2.2, *Type of Environmental Impact Report*, establishes that the SEIR tiers off the 2020 LRDP EIR and Addendum #5 to address climate change. In addition, page 47 of the Draft SEIR further summarizes the findings of Addendum #5 with regard to impacts on climate change. The Draft SEIR discusses this addendum because it is directly relevant to analyzing the climate change impacts of the Project and increased campus headcount. The Draft SEIR's

summary of subsequent environmental documents in Section 2.2 is adequate for the purpose of tiering pursuant to CEQA Guidelines Section 15152.

Response ORG 4.9

The commenter asserts that UC Berkeley has not justified the need for 37,000 square feet of new space and the Draft SEIR is deficient because it does not reference a facility needs assessment. Please refer to the *Thematic Response: Proposed GSPP Events Space* and *Thematic Response: Need for Academic Building* for further discussion of the need for proposed academic space. The comment does not address a significant environmental impact, and no further response is required in accordance with CEQA.

Response ORG 4.10

The commenter maintains that the Draft SEIR is deficient because it does not show the relationship between proposed GSPP expansion and associated increases in staff and students. As described in Draft SEIR Section 3.5, *Project Description*:

The new academic building would accommodate GSPP operations that currently take place in the existing GSPP buildings and other rented space on campus (e.g., Cal Memorial Stadium), while expanding the program's overall capacity. It is anticipated that at full student growth by the end of the 2023 school year the academic building would serve an additional five staff members and 30 students on an average, year-round basis relative to existing conditions. Additional students would be part of GSPP's Masters of Public Affairs and executive education programs. The number of masters students would increase from 35 to 100 students, at most. The Masters of Public Affairs program largely takes place during the summer. The new building would also accommodate additional one-to-two-week executive education programs with 30 to 50 participants.

The comment does not address a significant environmental impact, and no further response is required in accordance with CEQA.

Response ORG 4.11

The commenter states that the Draft SEIR provides no information on the number and size of events that could occur in the academic building's event space and therefore it does not properly assess potential noise impacts. Please refer to *Thematic Response: Proposed GSPP Events Space* for further discussion of use of this space. Concerning noise impacts, the Draft SEIR analyzes noise generation by activities at the proposed building on adjacent residents. As discussed in the Draft SEIR, heating, ventilation, and air conditions (HVAC) equipment and outdoor gatherings on the proposed academic building's rooftop terrace would generate noise. However, the Draft SEIR concluded that noise associated with outdoor events would not cause City of Berkeley Noise Ordinance limits to be violated at nearby sensitive receptors and therefore, would be less than significant.

Response ORG 4.12

The commenter expresses concern that events should be located nearby public transit. As described in *Thematic Response: Parking*, UC Berkeley plans to add a new shuttle service to provide access across the campus. Also, as discussed in Section 3, *Project Description*, of the Draft SEIR, Hearst Avenue, adjacent to the Project site "is an intensely used circulation corridor for pedestrians and transit commuters, as a bus stop in front of Cory Hall serves the Perimeter (P) and Central Campus (C) lines of Bear Transit, AC

Transit lines 52 and F, and the Blue and Orange Berkeley Lab routes." This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response ORG 4.13

The commenter expresses concern that the proposed residential building would be out of scale with its surroundings. For discussion of the Upper Hearst Development's impacts on cultural resources related to the design and scale of proposed buildings, please refer to the responses to Letter A 1 from the Landmarks Preservation Commission and Letter ORG 1 from the Berkeley Architectural Heritage Association (BAHA).

Response ORG 4.14

The commenter states an opinion that UC Berkeley's treatment of the increase in student enrollment is inconsistent with how it presented student enrollment increases in the 2020 LRDP and in the Notice of Preparation for the Draft SEIR because increased enrollment is not the first element described in the Draft SEIR. Therefore, the commenter claims that the Draft SEIR is not tiering from the 2020 LRDP EIR. The order in which the Draft SEIR discusses the updated population baseline does not materially affect the adequacy of its analysis of this issue. As discussed in Response ORG 4.1, the Draft SEIR takes into account increased enrollment throughout the document. Please also note that the Draft SEIR is not an LRDP EIR, and the SEIR is not intended to substitute for the analysis of the campus's next LRDP Update, which will be prepared in the next few years.

Response ORG 4.15

The commenter states that UC Berkeley has failed to document the need for increased student enrollment and disputes the contention in the Draft SEIR that the growth of college age Californians is not the primary reason behind increased student enrollment. Please refer to Response ORG 4.1 for a discussion of this issue.

Response ORG 4.16

The commenter asserts that increased enrollment at UC Berkeley is a discretionary action undertaken by The Regents. CEQA Guidelines Section 15357 defines a "discretionary project" as one "that requires the exercise of judgment or deliberation when the public agency or body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations." Please see *Thematic Response: Environmental Analysis of the Updated Population Baseline* for an explanation of why an increase in student enrollment is not a "project" under CEQA.

Response ORG 4.17

The Regents' approval of a Budget Plan for 10,000 additional undergraduates at UC campuses in the next three years does not on its face contradict the need for 11,285 additional students at the UC Berkeley campus. Please refer to Response ORG 4.1 for a discussion of this issue.

Response ORG 4.18

The commenter asserts that because campus headcount has increased beyond 2020 LRDP projections, student enrollment should be analyzed separately from the GSPP development project. Please see *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of why UC

Berkeley does not believe that it is appropriate under CEQA to sever the environmental analysis of the Upper Hearst Development from the increase in campus headcount.

Response ORG 4.19

The commenter maintains that the Draft SEIR's environmental analysis and determination related to increased student enrollment are flawed because they are based on faulty data and findings. Please see *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the Draft SEIR's analysis of environmental impacts resulting from increased enrollment.

Response ORG 4.20

The commenter states that the Draft SEIR's analysis of aesthetic impacts does not address the issues of improper trash disposal and littering by students living off-campus. Sporadic litter problems do not rise to the level of significant aesthetic impact under CEQA. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of these issues in relation to increased student enrollment.

Response ORG 4.21

The commenter contends that the Draft SEIR's analysis of population and housing impacts not address the prospect of additional off-campus physical development to accommodate increased student enrollment. Please refer to *Thematic Response: Environmental Analysis of the Updated Population*, and Response A 5.4 for discussions of this issue.

Response ORG 4.22

The commenter states an opinion that increased student enrollment could displace low-income Berkeley residents, causing longer commutes that would result in additional greenhouse gas emissions. The commenter asserts that the Draft SEIR ignores this effect. Page 152 of the Draft SEIR acknowledges that increased student enrollment would exert greater demand on the private housing market, potentially leading to the displacement of tenants in Berkeley. However, the commenter does not present specific evidence that a substantial number of residents would be displaced and would move to locations that require longer commutes by motor vehicle, which could result in additional greenhouse gas emissions from transportation. Please refer to *Thematic Response: Housing* for further discussion of displacement caused by increased enrollment. As discussed on page 118 of the Draft SEIR, increased student enrollment would have a potentially significant impact on climate change, but implementation of Mitigation Measure GHG-1 would ensure that UC Berkeley meets applicable regulatory targets for reducing emissions. This measure would implement the UC system's aggressive policy of achieving campus-wide carbon neutrality in Scope 1 and 2 emissions by the year 2025. With implementation of Mitigation Measure GHG-1, the Project would have a less than significant impact on climate change.

The commenter also opines that reductions in greenhouse gas emissions "cannot be used to 'offset' other environmental impacts." The Draft SEIR evaluates each environmental impact independently and does not state that reducing greenhouse gas emissions would effectively offset the Project's other environmental impacts. It is the responsibility of UC decision-makers to weigh the Project's environmental impacts and other adverse or beneficial effects in their totality when considering approval of the Project. Therefore, this opinion will be forwarded to UC decision-makers for their consideration.

Response ORG 4.23

The commenter alleges that the Draft SEIR ignores the Project's effect on the City of Berkeley's stormwater system, asserting that the construction of new on-campus housing would increase off-site runoff. However, as discussed on page 126 of the Draft SEIR, UC Berkeley will continue to implement 2020 LRDP Continuing Best Practice HYD-4-e to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions, and as further stated on page 126 of the Draft SEIR:

“...because substantial development capacity remains under the 2020 LRDP, future physical development associated with an increased campus headcount would not be additional to that planned for in the 2020 LRDP. Accordingly, the increase in UC Berkeley's existing and projected headcount would not require additional physical development beyond that planned for in the 2020 LRDP that could affect attainment of water quality standards or water discharge requirements, affect ground water supplies, alter drainage patterns, create excessive water runoff, or substantially degrade water quality.”

Therefore, increased student enrollment would not result in additional stormwater runoff than anticipated in the 2020 LRDP EIR. Furthermore, as noted on page 128 of the Draft SEIR, UC Berkeley requires that new development and redevelopment projects treat stormwater runoff by using Low Impact Development (LID) techniques. Continued implementation of these techniques would prevent the volume of peak stormwater flow during storm events from increasing beyond existing conditions. Therefore, the construction of new on-campus housing would not burden the City's stormwater system.

Response ORG 4.24

The commenter asserts that the Draft SEIR understates the effects of increased student enrollment on the community, with respect to noise, increased late-night traffic, and litter. Sporadic litter problems do not rise to the level of a significant aesthetic impact under CEQA. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the off-campus impacts of increased enrollment.

Response ORG 4.25

The Commenter maintains that the Draft SEIR is deficient because it fails to substantiate its findings that increased campus headcount would not result in significant environmental impacts within the City of Berkeley, including increased noise, trash and demands on City public safety services, parking and parks. As stated on Page 48 of the Draft SEIR, “All answers take account of the whole action involved, including beneficial, direct, indirect, construction-related, operational, and cumulative impacts, based on the checklist questions set forth in Appendix G of the CEQA Guidelines.” Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the Draft SEIR's analysis of off-campus environmental impacts resulting from increased enrollment.

Response ORG 4.26

The commenter suggests that the Draft SEIR include a “Student Housing Only” alternative and an alternative to the proposed increase in student enrollment that evaluates shifting new UC Berkeley students to other UC campuses with lower housing costs and adequate land. CEQA Guidelines Section 15126.6 requires a Draft EIR to include a reasonable range of potentially feasible alternatives to the proposed project that will foster informed decision-making and public participation. Chapter 8 of the

Draft SEIR contains an analysis of four alternatives to the proposed Project, including the required No Project Alternative. Although the Draft SEIR does not analyze a Student Housing Only alternative, the potential impacts of such an alternative can be inferred from the Draft SEIR's analysis and fall within the range of impacts discussed for the proposed Project and the four alternatives. Furthermore, a Student Housing Only alternative would fail to satisfy any of the Project objectives related to the GSPP's academic needs and is therefore infeasible.

The suggestion of providing an alternative to the increased student enrollment by shifting students to other campuses is contrary to CEQA. First, an increase in campus enrollment is an update to baseline conditions, as discussed in *Thematic Response: Environmental Analysis of the Updated Population Baseline*, and population is not a "project" under CEQA. An alternatives analysis in a Draft EIR is required to "describe a range of reasonable alternatives to the project." Second, Public Resources Code Section 21080.09 clearly indicates that UC student enrollment is to be analyzed at the individual campus level, not on a UC system-wide basis. The Enrolled Bill Report for the legislation enacting Public Resources Code Section 21080.09 (Senate Bill 896, Mello) clarifies that the intent of the bill was to ensure that CEQA evaluation of student enrollment changes should be addressed at each campus individually as part of the LRDP process, and not on a statewide or system-wide basis. The bill's author stated that the bill "clarifies the intent of existing law that the appropriate place for environmental review of the impact of academic and enrollment plans under CEQA is in a Long Range Development Plan EIR...for the particular campus or medical center where the environmental impact actually takes place" and not on a "statewide, systemwide basis." See letter dated September 12, 1989, from State Senator Henry J. Mello to Governor George Deukmejian.

Letter IND 1

COMMENTER: Elise Mills, Contract & Grant Manager ERSO, UC Berkeley

DATE: February 26, 2019

Response IND 1.1

The commenter expresses concern about parking availability, especially during construction of the Upper Hearst Development. The commenter also recommends converting public parking spaces in the Lower Hearst garage. Please see *Thematic Response: Parking* for a discussion of parking availability during construction and operation of the proposed Project.

The commenter also recommends paving a path from the Foothill parking lot along Hearst Avenue to improve public safety. While this action would not address a safety concern caused by the Upper Hearst Development, the recommendation will be forwarded to UC decision-makers for their consideration.

Response IND 1.2

The commenter expresses concern that the lack of transit options near the north side of campus late at night results in unsafe conditions. As mentioned above in *Thematic Response: Parking*, UC Berkeley plans to add a new shuttle service to provide access across the campus.

Letter IND 2

COMMENTER: Gina Banton, Human Resources Operations Lead, ERSO, UC Berkeley

DATE: February 27, 2019

Response IND 2.1

The commenter expresses opposition to demolition of the Upper Heart parking structure. Please refer to *Thematic Response: Parking*, for a discussion of parking availability and substitute parking options for UC Berkeley employees.

Letter IND 3

COMMENTER: James Casey

DATE: February 27, 2019

Response IND 3.1

The commenter expresses concern about the loss of parking on the Project site for C permit holders. Please see *Thematic Response: Parking* for a discussion of future parking options, including additional parking for C permit holders.

The commenter also suggests a UC Berkeley-negotiated option with ride-share apps such as Lyft and Uber to accommodate rides on campus as an affordable option in the place of paying for parking. This suggestion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 4

COMMENTER: Laura Waller, Associate Professor, Department of Electrical Engineering and Computer Sciences, UC Berkeley

DATE: February 27, 2019

Response IND 4.1

The commenter expresses opposition to the reduction in parking spaces due to demolition of the Upper Hearst parking structure. Please refer to *Thematic Response: Parking* for a discussion of parking availability and substitute parking options.

Response IND 4.2

The commenter opines that an additional shuttle service would not represent an adequate solution to reduce parking. The commenter asserts that using a shuttle would increase commute time for those with children, adding to their workday and adding cost to UC Berkeley overall. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration. Please also refer to *Thematic Response: Parking* for an updated discussion of shuttle options for UC Berkeley employees.

Letter IND 5

COMMENTER: Logan Baldini, Building Manager – Cory Hall, UC Berkeley

DATE: February 27, 2019.

Response IND 5.1

The commenter expresses opposition to any net decrease in parking spaces due to the Upper Hearst Development. The commenter requests an additional 90 parking spaces to accommodate the new development. Please refer to *Thematic Response: Parking* for a discussion of parking availability and the provision of additional parking.

In addition, the commenter asserts that more UC Berkeley staff would use street parking and have to move their cars every two hours, causing a safety hazard. The commenter does not provide specific evidence that additional street parking activity would result in a safety hazard. Nonetheless, this concern will be forwarded to UC decision-makers for their consideration.

Letter IND 6

COMMENTER: Lydia Raya, Computer Science Advisor, UC Berkeley

DATE: February 27, 2019

Response IND 6.1

The commenter expresses concern about parking availability, especially for F and C permit holders. The commenter suggests that the entire Lower Hearst parking structure be made available to F and C permit holders once construction commences and remains as such for the future. Please see *Thematic Response: Parking* for a discussion of parking availability and additional parking provided for F and C permit holders.

Letter IND 7

COMMENTER: Reza Alam, Associate Professor, Mechanical Engineering, UC Berkeley

DATE: February 27, 2019

Response IND 7.1

The commenter expresses concern about the Upper Hearst Development's effect on already limited parking availability. Please refer to *Thematic Response: Parking* for further discussion of parking availability.

Letter IND 8

COMMENTER: Sharon Norris

DATE: February 27, 2019

Response IND 8.1

The commenter expresses concern about the Upper Hearst Development's effect on parking availability and suggests adding smaller and more frequent shuttles offered from the north and east sides of campus to transport people from the North Berkeley BART station and the Richmond Field Station. The commenter further suggests the addition of a large parking lot near the Richmond Field Station to allow for patrons to park and ride to the campus as well as other park and ride lots at various locations on the North, South and East sides of campus. Please refer to *Thematic Response: Parking* for further discussion of parking availability and additional shuttles for people commuting to campus.

Letter IND 9

COMMENTER: Tony Keaveny, Professor, Departments of Mechanical Engineering and Bioengineering, UC Berkeley

DATE: February 27, 2019

Response IND 9.1

The commenter requests an analysis of the number of available parking spaces, faculty with parking permits, and evidence that UC Berkeley has enough parking availability during construction of the Upper Hearst Development. Parking availability in itself is not an environmental impact required for analysis in an EIR. Nonetheless, please refer to *Thematic Response: Parking* for further discussion of parking availability and additional parking provided during construction.

Response IND 9.2

The commenter states an opinion that the loss of parking at the project site would place undue burden on the faculty and staff, and a loss of productivity associated with commuting from the office to a distant parking location. Please refer to *Thematic Response: Parking* for further discussion of additional parking options to reduce effects on commute times, including a shuttle service proposed by UC Berkeley from distant parking lots.

Letter IND 10

COMMENTER: David Lerman

DATE: March 3, 2019

Response IND 10.1

The commenter opines that UC Berkeley should develop student housing on all sites, including the land known as “People’s Park.” As mentioned in *Thematic Response: People’s Park*, the proposed Upper Hearst Development studied in the Draft SEIR does not include, nor would it directly facilitate, development at People’s Park. This is outside of the scope of the proposed Project considered in the Draft SEIR.

Letter IND 11

COMMENTER: Carol Denney

DATE: March 6, 2019

Response IND 11.1

The commenter expresses opposition to building housing on People's Park, and states that it is a city landmark and holds importance as an international symbol. As discussed in *Thematic Response: People's Park*, development on the People's Park site is not included as part of the proposed Upper Hearst Development, so this topic is outside the scope of the Draft SEIR.

Letter IND 12

COMMENTER: Bruce Bagnell

DATE: March 8, 2019

Response IND 12.1

The commenter expresses support for eliminating new gas hook-ups in Berkeley. The commenter's concerns align with both the Upper Hearst Development's design and the Green Building Design measures in the University of California's Sustainable Practices Policy because the proposed academic building would have an all-electric system and would not use on-site fossil fuel combustion for space and water heating. The commenter's opinion about energy sources does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 13

COMMENTER: Derek Sagehorn

DATE: March 8, 2019

Response IND 13.1

The commenter expresses support for the Upper Hearst Development because it would add new housing for students. This opinion about the merits of the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 14

COMMENTER: Tommaso Sciortino

DATE: March 8, 2019

Response IND 14.1

The commenter requests that UC Berkeley increase the height of the Upper Hearst Development to accommodate additional housing units. This opinion about the provision of housing does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 15

COMMENTER: Alfred Twu

DATE: March 9, 2019

Response IND 15.1

The commenter requests that UC Berkeley increase the height of the Upper Hearst Development to accommodate additional housing units. This opinion about the provision of housing does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 16

COMMENTER: Alper Atamturk

DATE: March 11, 2019

Response IND 16.1

The commenter expresses concern about the loss of parking spaces on-site and requests the provision of additional parking. The commenter also opines that shuttles and e-scooters would be inadequate to replace lost parking. Please refer to *Thematic Response: Parking* for a discussion of parking availability and the provision of additional parking.

Letter IND 17

COMMENTER: Andrew Baker

DATE: March 11, 2019

Response IND 17.1

The commenter urges UC Berkeley to reconsider the exterior design of the proposed Upper Hearst Development to be more compatible with the historic character of the area. Please refer to *Thematic Response: Aesthetics* for a discussion of the Upper Hearst Development's significant impact on visual character and quality. The Draft SEIR acknowledges that the proposed buildings on the project site would depart from the setting of adjacent historical resources, and therefore determines that the new building would have a significant and unavoidable impact on aesthetics and historical resources. Nonetheless, the commenter's request will be forwarded to UC decision-makers for their consideration.

Letter IND 18

COMMENTER: Ann May

DATE: March 11, 2019

Response IND 18.1

The commenter expresses support for the Reduced Scale Alternative to protect the neighborhood's aesthetics. This opinion about alternatives does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 19

COMMENTER: Dorit Hochbaum, Professor, Department of IE&OP, UC Berkeley

DATE: March 11, 2019

Response IND 19.1

The commenter expresses concern about the loss of parking spaces on the Project site and requests construction of a new parking structure near the Project site to provide access to the College of Engineering. The proposed Upper Hearst Development would involve construction of a new parking structure on the Project site to replace some of the spaces that would be lost due to demolition of the existing Upper Hearst parking structure. Please refer to *Thematic Response: Parking* for a discussion of additional parking options for UC Berkeley employees.

Letter IND 20

COMMENTER: James Rector

DATE: March 11, 2019

Response IND 20.1

The commenter expresses disbelief that the Upper Hearst parking structure would be demolished with “no real alternative plans.” The proposed Upper Hearst Development would involve construction of a new parking structure on the Project site to replace some of the spaces that would be lost due to demolition of the existing Upper Hearst parking structure. Please refer to *Thematic Response: Parking* for a discussion of additional parking options for UC Berkeley employees.

Letter IND 21

COMMENTER: Johnathan Bray, Professor, Department of Civil & Environmental Engineering,
UC Berkeley

DATE: March 11, 2019

Response IND 21.1

The commenter asserts that UC Berkeley needs to replace the parking spaces lost due to demolition of the Upper Hearst parking structure, since reduced parking availability would adversely affect the productivity of College of Engineering faculty and staff. Please refer to *Thematic Response: Parking* for a discussion of parking availability and substitute parking options for UC Berkeley employees.

Letter IND 22

COMMENTER: Keith McAleer, Communications Director, Industrial Engineering & Operations Research, UC Berkeley

DATE: March 11, 2019

Response IND 22.1

The commenter expresses concern about the loss of parking on the Project site, asserting that spillover parking in the Lower Hearst parking structure would not be enough, as this lot is already full and is geographically inaccessible on the campus. The commenter requests consideration of adding a new parking structure for the College of Engineering. The proposed Upper Hearst Development would involve construction of a new parking structure on the Project site to replace some of the spaces that would be lost due to demolition of the existing Upper Hearst parking structure. Please refer to *Thematic Response: Parking* for a discussion of additional parking options for UC Berkeley employees.

Letter IND 23

COMMENTER: Matthew DeJong, Professor, Department of Civil & Environmental Engineering,
UC Berkeley

DATE: March 11, 2019

Response IND 23.1

The commenter expresses concern about the net loss of parking on the Project site with construction of the Upper Hearst Development. The commenter states an opinion that if parking is made more difficult on the campus, faculty and staff will choose to work away from campus, thus decreasing interaction between colleagues and degrading the work environment. Please refer to *Thematic Response: Parking* for a discussion of parking availability and additional parking options for UC Berkeley employees.

Letter IND 24

COMMENTER: Nicholas Sitar, Professor, Department of Civil & Environmental Engineering, UC Berkeley

DATE: March 11, 2019

Response IND 24.1

The commenter claims that the Draft SEIR is incorrect to characterize the reduction of parking as being carbon saving because people would switch to using ride-share services. The Draft SEIR's analysis of greenhouse gas emissions finds that because the Upper Hearst Development would reduce the number of parking spaces on-site, it "would not induce demand for additional driving." As determined in the traffic study prepared for the Upper Hearst Development (Appendix F to the Draft SEIR), the reduction in parking spaces would cause a net reduction in vehicle trips to and from the Project site. Although reduced parking could induce additional use of ride-share services, as discussed in *Thematic Response: Traffic*, it is expected that this effect would not override the reduction in vehicle trips. Therefore, reduced parking availability would not result in additional GHG emissions.

The commenter further opines that public transit is not a feasible option for many as working parents and those who live outside of the area. The commenter notes that while faculty are generally more able to cope with increased commute times, other staff may be unfairly impacted and may chose to find employment elsewhere under the circumstances. The commenter suggests adding a new building in the footprint of an existing surface parking lot as an alternative and states an opinion that this would be a better option to minimize impacts. The Draft SEIR presents a reasonable range of alternatives, consistent with CEQA requirements; nonetheless, this opinion will be forwarded to UC decision-makers for their consideration.

Letter IND 25

COMMENTER: Norah Foster

DATE: March 11, 2019

Response IND 25.1

The commenter expresses opposition to a project at People's Park. As discussed in *Thematic Response: People's Park*, development on the People's Park site is not included as part of the proposed Project, so this topic is outside the scope of the Draft SEIR.

Letter IND 26

COMMENTER: Paulo Monteiro, Professor, Department of Civil and Environmental Engineering,
UC Berkeley

DATE: March 11, 2019

Response IND 26.1

The commenter asserts that demolition of the Upper Hearst parking structure would be disruptive to the College of Engineering and requests that UC Berkeley reconsider preserving the parking structure. The Upper Hearst Development would involve construction of a new parking structure on-site to replace some of the spaces that would be lost due to demolition of the Upper Hearst parking structure. Please also refer to *Thematic Response: Parking* for a discussion of parking availability and substitute parking options.

Letter IND 27

COMMENTER: Rhonda Righter

DATE: March 11, 2019

Response IND 27.1

The commenter expresses support for building more housing even at the expense of parking availability. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 28

COMMENTER: Susan Kellogg-Smith, Buyer, NanoLab Procurement & Accounts Payable, UC Berkeley

DATE: March 11, 2019

Response IND 28.1

The commenter expresses concern about the loss of parking spaces for F permit holders due to demolition of the Upper Hearst parking structure. Please refer to *Thematic Response: Parking* for a discussion of parking availability and the provision of additional parking for F permit holders.

Letter IND 29

COMMENTER: Fotini Katopodes Chow, Professor, Department of Civil & Environmental Engineering, UC Berkeley

DATE: March 11, 2019

Response IND 29.1

The commenter expresses support for reducing parking availability to promote alternative modes of commuting and reducing UC Berkeley's carbon footprint. In addition, the commenter suggests that UC Berkeley provide incentives for commuting by e-bike or public transit, such as a BART subsidy. Please also refer to *Thematic Response: Parking* for a discussion of additional shuttle options for commuters. The commenter's opinion about reducing parking and suggestion for additional incentives for alternative modes of transportation do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 30

COMMENTER: Alex Horne, Professor Emeritus, Department of Civil & Environmental Engineering, UC Berkeley

DATE: March 12, 2019

Response IND 30.1

The commenter expresses opposition to the loss of parking spaces on the Project site and asserts that shuttles would not adequately compensate for this loss because of their inconvenience. Please also refer to *Thematic Response: Parking* for a discussion of parking availability and shuttle options. The commenter's opinions about reduced parking availability and shuttles do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 31

COMMENTER: Arpad Horvath, Professor, Department of Civil & Environmental Engineering,
UC Berkeley

DATE: March 12, 2019

Response IND 31.1

The commenter expresses opposition to the loss of parking on-site and states that additional parking is actually needed. This opinion about the need for parking does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration. Please refer to *Thematic Response: Parking* for a discussion of parking availability.

Letter IND 32

COMMENTER: Charlotte Jones, Research Support Assistant, ERSO, UC Berkeley

DATE: March 12, 2019

Response IND 32.1

The commenter asks if UC Berkeley can add another level of parking to the proposed Project. Please refer to *Thematic Response: Parking* for further discussion of parking availability on and off the Project site. The commenter's request for an additional level of parking on-site does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 33

COMMENTER: Edward Hester, R&D Engineer 3, Marvell NanoLab, UC Berkeley

DATE: March 12, 2019

Response IND 33.1

The commenter asserts that the Project site is large enough to fit GSPP's expansion while retaining the existing Upper Hearst parking structure. The commenter expresses concern about the loss of parking and opines that replacing the parking with housing is a poor choice. These opinions do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 34

COMMENTER: John Steel, Professor of Mathematics, UC Berkeley

DATE: March 12, 2019

Response IND 34.1

The commenter objects to the loss of parking on the Project site. Please refer to *Thematic Response: Parking* for a discussion of parking availability. The commenter's opinion about the need for parking does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 35

COMMENTER: Julia Konopasek, Undergraduate Advisor & Scheduler, Department of Civil & Environmental Engineering, UC Berkeley

DATE: March 12, 2019

Response IND 35.1

The commenter expresses concern about the loss of parking spaces on the Project site and its effect on the commute times of UC Berkeley employees. Please refer to *Thematic Response: Parking* for further discussion of parking availability and alternative parking options.

Letter IND 36

COMMENTER: Karen Mendelow Nelson

DATE: March 12, 2019

Response IND 36.1

The commenter asks UC Berkeley to consider additional parking at the Upper Hearst Development. The proposed development would include a rebuilt Upper Hearst parking structure that would replace some of the parking that would be removed as a result of the proposed Project. Please refer to *Thematic Response: Parking* for further discussion of parking availability.

Letter IND 37

COMMENTER: Laurie Pfohl

DATE: March 12, 2019

Response IND 37.1

The commenter opines that People's Park should be retained as a park. As discussed in *Thematic Response: People's Park*, development on the People's Park site is not included as part of the proposed Project, so this topic is outside the scope of the Draft SEIR.

Letter IND 38

COMMENTER: Lesley Emmington

DATE: March 12, 2019

Response IND 38.1

The commenter expresses concern that UC Berkeley has already decided on the proposed Project without proper public notification. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of public involvement in the process of planning the Project and documenting its environmental impacts. It is anticipated that the UC Regents will consider approval of the Project at its May meeting.

Response IND 38.2

The commenter asserts that the Upper Hearst Development would be incompatible with historical resources in the surrounding neighborhood. This statement does not conflict with the Draft SEIR, which acknowledges that the proposed buildings would have a significant and unavoidable impact on historical resources. Please refer to Response A 1.1 for additional discussion of impacts to historical resources.

Response IND 38.3

The commenter asks UC Berkeley what justifies the Upper Hearst Development going forward considering the significant and unavoidable environmental impacts identified in the Draft SEIR. Please refer to *Thematic Response: Need for the Project* for an explanation of the need for the proposed development. As discussed there, GSPP's existing facilities have exceeded their capacity and cannot accommodate key elements of the program without more academic and residential space. The Upper Hearst Development would help to meet these needs by providing housing opportunities as well as additional building space for the GSPP to maintain its various programs at elite levels. To justify approval of a project that would have significant and unavoidable environmental impacts, the CEQA Guidelines require that the lead agency prepare CEQA Findings with a Statement of Overriding Considerations that explains how a project's social and other benefits outweigh its significant environmental impacts.

The commenter also asks if financial considerations are motivating the timing of the Upper Hearst Development. Please refer to *Thematic Response: Fiscal Impacts* for a discussion of this issue.

Response IND 38.4

The commenter states an opinion that if the Upper Hearst Development is not urgent, then UC Berkeley should devote time to redesigning its façade, footprint, and massing to respect the historic context. Please refer to Response A 1.7 for a discussion of Mitigation Measure CUL-1, which the Draft SEIR would require in the interest of considering modifications to exterior building features that would have greater compatibility with historical resources.

Response IND 38.5

The commenter suggests that GSPP should address the concerns of Berkeley residents and use this as an opportunity to teach students to respect the environment and architectural context. This suggestion for GSPP does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration

Response IND 38.6

The commenter opines that it is inappropriate to review the Upper Hearst Development's physical impacts and analyze increased student enrollment in the same environmental document. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing both elements in the Draft SEIR.

Response IND 38.7

The commenter asserts that student enrollment warrants its own separate, thorough environmental analysis because it currently surpasses the 2020 LRDP's projections and is a "multifaceted issue in itself." Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing both elements in the Draft SEIR.

Letter IND 39

COMMENTER: Maribel Castillo-Glaze, Admissions Staff, Department of Civil & Environmental Engineering, UC Berkeley

DATE: March 12, 2019

Response IND 39.1

The commenter states an opinion that the plan to demolish the Upper Hearst parking structure without plans for staff to park is “incomprehensible.” The commenter asks where staff would be able to park, how much it would cost to take public transportation, and if any incentives are planned. Please refer to *Thematic Response: Parking* for a discussion of parking availability for UC Berkeley staff and public transportation options including a shuttle system servicing the campus and vicinity; discounted carpool permits and transit passes; and expansive bicycle infrastructure. UC Berkeley does not plan to provide additional financial subsidies for public transportation.

Letter IND 40

COMMENTER: Mary West, Staff Research Associate IV/QB3 Shared Stem Cell Facility and High-Throughput Screening Facility Director, UC Berkeley

DATE: March 12, 2019

Response IND 40.1

The commenter expresses concern about the loss of parking from demolition of the Upper Hearst parking structure, suggesting that commute times would increase as people search for alternate parking locations. Please refer to *Thematic Response: Parking* for a discussion of parking availability for UC Berkeley staff and alternative parking options.

Letter IND 41

COMMENTER: Phyllis Broadnax, Administrative Assistant, Unit 4 Housing, UC Berkeley

DATE: March 12, 2019

Response IND 41.1

The commenter expresses disappointment with the proposed loss of parking from demolition of the Upper Hearst parking structure and concern about the need to walk from parking at the Lower Hearst parking structure. Please refer to *Thematic Response: Parking* for a discussion of parking availability for UC Berkeley staff and alternative parking options.

Letter IND 42

COMMENTER: Reed Helgens, ERSO, UC Berkeley

DATE: March 12, 2019

Response IND 42.1

The commenter expresses concern about the effect of reduced parking availability on staff commute costs and time. The commenter states an opinion that the cost of public transport would increase commuter cost and adding time on shuttles and working with BART schedules would add transportation time and stress. Please refer to *Thematic Response: Parking* for a discussion of parking availability for UC Berkeley staff, alternative parking options, and additional shuttles.

Response IND 42.2

The commenter suggests that UC Berkeley encourage more telecommute days allowed for employees who currently use the Upper Hearst parking structure. The commenter states an opinion that this would help to minimize the impact of loss of parking availability. Please refer to *Thematic Response: Parking* for a discussion of measures to minimize the effect of reduced parking availability on UC Berkeley employees. The commenter's suggestion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers to their consideration.

Response IND 42.3

The commenter suggests that UC Berkeley allow people to share parking spaces, with a subset of staff in the same building rotating days when they are not using the space. The commenter states an opinion that this would help to minimize the impact of loss of parking availability. Please refer to *Thematic Response: Parking* for a discussion of measures to minimize the effect of reduced parking availability on UC Berkeley employees. The commenter's suggestion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers to their consideration.

Letter IND 43

COMMENTER: Rita Nichiporuk, QB3 Mass Spectrometry Facility, UC Berkeley

DATE: March 12, 2019

Response IND 43.1

The commenter states an opinion that demolition of the Upper Hearst parking structure is bad public policy because it would deteriorate the parking situation on campus to a greater level than currently exists. Please refer to *Thematic Response: Parking* for a discussion of parking availability and alternate parking options. The commenter's opinion about parking does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers to their consideration.

Letter IND 44

COMMENTER: Ruzena Bajcsy

DATE: March 12, 2019

Response IND 44.1

The commenter states opposition to the Upper Hearst Development, asserting that it would force people to walk farther to campus and cause “hardship.” Please refer to *Thematic Response: Parking* for a discussion of measures to minimize the effect of reduced parking availability on UC Berkeley employees.

Letter IND 45

COMMENTER: Ryan Rivers, R&D Engineer 3 – Process Staff, UC Berkeley

DATE: March 12, 2019

Response IND 45.1

The commenter states an opinion that demolition of the Upper Hearst parking structure would be a logistical disaster because UC Berkeley “has no reasonable plan to expand parking prior to this development.” Please refer to *Thematic Response: Parking* for a discussion of additional parking options for UC Berkeley employees. The commenter’s opinion does not question or challenge the adequacy of the Draft SEIR’s environmental analysis but will be forwarded to UC decision-makers to their consideration.

Response IND 45.2

The commenter acknowledges that the campus is need of additional housing but states an opinion that the lack of provision for additional parking prevents him from supporting the proposed Project. The commenter suggests that UC Berkeley provide temporary parking solutions during construction and retain most of the existing parking spaces on-site. Please refer to *Thematic Response: Parking* for a discussion of temporary additional parking during construction of the Upper Hearst Development. The commenter’s recommendation to retain most existing parking on-site does not question or challenge the adequacy of the Draft SEIR’s environmental analysis but will be forwarded to UC decision-makers to their consideration.

The commenter also asserts that demolition of parking on-site would eliminate some of the only ADA-accessible parking spaces in the area, which could provoke a lawsuit. Please refer to *Thematic Response: Parking* for a discussion of alternative ADA-accessible parking locations that would be available.

In addition, the commenter opines that reduced parking availability would decrease the productivity of UC Berkeley employees. This opinion does not question or challenge the adequacy of the Draft SEIR’s environmental analysis but will be forwarded to UC decision-makers to their consideration.

Letter IND 46

COMMENTER: Shelley Okimoto, Graduate Student Adviser, UC Berkeley

DATE: March 12, 2019

Response IND 46.1

The commenter requests that UC Berkeley retain the existing Upper Hearst parking structure. The commenter states an opinion that the loss of this parking structure would lead to a wide variety of negative outcomes for faculty, staff and students. These include more time, gas and energy spent looking for parking; increased traffic on campus; potential loss of staff and more difficulty recruiting new staff; increases in the number of worker's compensation lawsuits; and loss of contact with emeriti and retirees on campus. Many of the issues raised by the commenter are socio-economic impacts outside the purview of CEQA, which provides for analysis of environmental impacts. As discussed in the Draft SEIR and *Thematic Response: Traffic*, it is estimated that the Upper Hearst Development would result in a net decrease in vehicle trips to and from the Project site, so it would not result in increased traffic. Please refer to *Thematic Response: Parking* for a discussion of parking availability and measures to minimize time and energy spent searching for parking. The commenter's other opinions do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers to their consideration.

Letter IND 47

COMMENTER: Wenjun Zhang

DATE: March 12, 2019

Response IND 47.1

The commenter expresses concern about the Upper Hearst Development's effect on parking availability for C permit holders. Please refer *Thematic Response: Parking* for a discussion of additional parking options for C permit holders.

Letter IND 48

COMMENTER: Bill Boyd, System Administrator, Astronomy, UC Berkeley

DATE: March 13, 2019

Response IND 48.1

The commenter asks whether an equivalent number of alternative parking spaces to existing conditions on the Project site would be available during construction of the Upper Hearst Development. Please refer to *Thematic Response: Parking* for a discussion of additional parking locations available during the construction period.

Letter IND 49

COMMENTER: Charles Pugh

DATE: March 13, 2019

Response IND 49.1

The commenter expresses dissatisfaction with noticing of the proposed demolition of the Upper Hearst parking structure. Please refer to *Thematic Response: Noticing and Consultation* for a comprehensive description of instances when UC Berkeley notified the campus community of the Upper Hearst Development, which would include demolition of the existing parking structure.

The commenter also asks how many parking spaces would be available for F and C permit holders at the Maxwell Family Field and Stadium garage. Please refer to *Thematic Response: Parking* for a discussion of parking availability for permit holders at this parking lot.

Letter IND 50

COMMENTER: Felicia Bautista, Undergraduate Student Services Advisor, Department of Engineering Science, UC Berkeley

DATE: March 13, 2019

Response IND 50.1

The commenter states an opinion that demolition of the Upper Hearst parking structure would adversely affect College of Engineering employees. The commenter asks that UC Berkeley retain the parking structure unless there is a plan to offset the loss of parking spaces. Please refer to *Thematic Response: Parking* for a discussion of parking availability and substitute parking options for UC Berkeley employees.

Letter IND 51

COMMENTER: Jack Moehle, Professor, Department of Civil & Environmental Engineering, UC Berkeley

DATE: March 13, 2019

Response IND 51.1

The commenter expresses opposition to the proposed Project, opining that consultation with the College of Engineering has been inadequate and the loss of parking would adversely affect its staff and faculty. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of noticing and consultation with the UC Berkeley campus community. Also, please refer to *Thematic Response: Parking* for a discussion of measures to offset the loss of parking on-site.

Letter IND 52

COMMENTER: Jeannie Powers, Research Administrator, UC Berkeley

DATE: March 13, 2019

Response IND 52.1

The commenter states an opinion that demolition of the Upper Hearst parking structure would create hardship for many employees on campus. The commenter suggests that UC Berkeley do more to incentivize alternative modes of transportation. Please refer to *Thematic Response: Parking* for a discussion of measures to offset the loss of parking on-site and additional transit options.

Letter IND 53

COMMENTER: Ruben Lizardo, Director, Local Government and Community Relations, Office of the Chancellor, UC Berkeley, from Nicholas Sitar, Professor, Department of Civil & Environmental Engineering, UC Berkeley

DATE: March 13, 2019

Response IND 53.1

The commenter conveys opinions from Professor Nicholas Sitar that UC Berkeley employees are being treated poorly with regard to the impact of the loss of parking spaces, and that using public transit would not be an adequate alternative to parking. These opinions do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 53.2

The commenter also notes Professor Sitar's request that notice of proposed projects is sent to Deans, Department Chairs, and Facilities Managers. Please refer to the *Thematic Response: Noticing and Consultation* for further response to comment and an explanation of the noticing for the proposed Project.

Letter IND 54

COMMENTER: Daniel Tataru, Professor, Mathematics, UC Berkeley

DATE: March 14, 2019

Response IND 54.1

The commenter states an opinion that replacing the existing parking garage is poorly planned and would exacerbate the parking situation on campus. The commenter further opines that there is no reasonable plan to replace parking in the short or long term. Please refer to *Thematic Response: Parking* for a discussion of parking availability and additional parking options under the proposed Project.

Letter IND 55

COMMENTER: Ruth Rosen, Professor Emerita of History, UC Davis

DATE: March 15, 2019

Response IND 55.1

The commenter opines that the proposed Project is too large in scale, too tall, and out of proportion with the neighborhood. Please refer to *Thematic Response: Aesthetics*, which acknowledges that the Draft SEIR finds a significant impact on visual character and quality in the neighborhood.

The commenter also states support for the Reduced Scale Alternative. This opinion about alternatives does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 56

COMMENTER: Topher Brennan

DATE: March 18, 2019

Response IND 56.1

The commenter expresses support for the proposed Project and the building of housing on-site. This opinion about the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 57

COMMENTER: Erika Shore

DATE: March 18, 2019

Response IND 57.1

The commenter asks where additional UC Berkeley students would be housed considering an existing housing shortage in Berkeley. The Draft SEIR's analysis of population and housing states that future UC Berkeley development and off-campus housing would accommodate the housing needs for additional students.

The commenter also asks for justification of the projected increase in student enrollment. Please refer to Response ORG 4.1 for a discussion of this issue.

Response IND 57.2

The commenter asks why GSPP needs approximately 37,000 square feet of new space. Please refer to the *Thematic Response: Proposed GSPP Events Space* and *Thematic Response: Need for Academic Building_for* further discussion of the need for proposed academic space.

Letter IND 58

COMMENTER: Fran Segal

DATE: March 18, 2019

Response IND 58.1

The commenter expresses support for the Reduced Scale Alternative to improve the compatibility of new development with the neighborhood. This opinion about alternatives does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision makers for their consideration.

Letter IND 59

COMMENTER: Iris Tommelein, Professor, Engineering and Project Management, UC Berkeley

DATE: March 18, 2019

Response IND 59.1

The commenter expresses concern about the proposed demolition of the Upper Hearst parking structure and asserts that the Lower Hearst parking structure cannot accommodate spillover parking. The commenter asks if UC Berkeley has studied whether other parking lots on campus would be able to accommodate additional cars. In addition, the commenter requests the creation of additional parking in the north side of campus. Please refer to *Thematic Response: Parking* for a discussion of additional parking options for people who currently use the Upper Hearst parking structure. The commenter's request for additional parking on the north side of campus does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 60

COMMENTER: Peter Hosemann, Professor and Department Chair, Department of Nuclear Engineering, UC Berkeley

DATE: March 19, 2019

Response IND 60.1

The commenter expresses concern about the loss of parking spaces on the Project site, asserting that it would affect recruitment and retention of staff, reduce accessibility to campus, hinder fundraising, and would cause faculty to work from home. Many of the issues raised by the commenter are socio-economic impacts outside the purview of CEQA, which provides for analysis of environmental impacts. Please refer to *Thematic Response: Parking* for a discussion of measures to offset the loss of parking spaces. The commenter's opinion about the secondary effects of reduced parking availability does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Additionally, the commenter states an opinion that the College of Engineering was not apprised of the proposed Project. Please refer to *Thematic Response: Noticing and Consultation* for an explanation of UC Berkeley's compliance with the requirements of CEQA to provide information about the Project and its environmental consequences to the public and the UC Berkeley community.

Letter IND 61

COMMENTER: Robert Kolenkow

DATE: March 19, 2019

Response IND 61.1

The commenter opines that the massing and height of proposed buildings would overwhelm the surrounding neighborhood. Please refer to *Thematic Response: Aesthetics* for a discussion of the Upper Hearst Development's significant impact on visual character and quality.

The commenter also expresses support for the Reduced Scale Alternative. This opinion about alternatives does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 62

COMMENTER: Brandy Thomas, Finance Manager, Department of Bioengineering, UC Berkeley

DATE: March 19, 2019

Response IND 62

The commenter expresses concern about demolition of the Upper Hearst parking structure, asserting that the loss of parking would cause hardship for UC Berkeley staff. The commenter asks if other alternative parking locations than the Lower Hearst parking structure area available. In addition, the commenter states an opinion that public transportation is an inconvenient alternative to parking. Please refer to *Thematic Response: Parking* for further discussion of alternative parking locations and measures to offset the loss of parking.

Letter IND 63

COMMENTER: Fatima Alleyne, Director of Faculty Engagement for Equity & Inclusion, College of Engineering, UC Berkeley

DATE: March 19, 2019

Response IND 63.1

The commenter opines that the public hearings on the Draft SEIR were located too far from the Project site and held at inconvenient hours. The commenter also recommends a location for a new public hearing. Please refer to *Thematic Response: Noticing and Consultation* for an explanation of UC Berkeley's compliance with the requirements of CEQA to provide information about the Project and its environmental consequences to the public and the UC Berkeley community.

Response IND 63.2

The commenter opines that by partnering with a developer on the proposed Upper Hearst Development, UC Berkeley would have no control over rental rates charged by the developer and therefore would not address the housing crisis. This concern about housing affordability does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 63.3

The commenter asks how UC Berkeley would accommodate the people displaced from parking on the Project site. Please refer to *Thematic Response: Parking* for a discussion of measures to offset the loss of parking on-site.

Letter IND 64

COMMENTER: John Phillips

DATE: March 19, 2019

Response IND 64.1

The commenter states support for the expansion of the campus in the coming years but concern that the Upper Hearst Development would not show appreciation or respect for the architectural character of the neighborhood. Please refer to *Thematic Response: Aesthetics* for a discussion of the Upper Hearst Development's impact on visual character and quality.

The commenter also suggests reconsidering the proposed development in favor of a more appropriate plan. This suggestion about redesigning the development does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 65

COMMENTER: Michael L. Anderson, Associate Professor, Department of Agricultural and Resource Economics, UC Berkeley

DATE: March 19, 2019

Response IND 65.1

The commenter expresses support for the proposed Project and converting the Project site to academic and residential uses. This opinion about the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 66

COMMENTER: Reza Alam, Associate Professor, Mechanical Engineering, UC Berkeley

DATE: March 19, 2019

Response IND 66.1

The commenter claims that the number of open parking spaces at the Foothill lot differs from what was presented. The Draft SEIR does not discuss parking availability at the Foothill lot. Although this concern does not question or challenge the adequacy of the Draft SEIR's environmental analysis, it will be forwarded to UC decision-makers for their consideration.

The commenter expresses concern about the loss of parking on the Project site, asking why UC Berkeley employees should face longer commutes and who should pay for the extra time. Parking availability in itself is not an environmental impact that warrants analysis in the SEIR. Nonetheless, please refer to *Thematic Response: Parking* for a discussion of this issue, including unprecedented measures UC Berkeley is taking to offset the loss of parking, such as making additional spaces available in the nearby Lower Hearst parking structure and Maxwell Family Field and Stadium garage and adding shuttles to the Foothill and Clark Kerr campus parking lots. UC Berkeley would not provide financial compensation for longer commute times.

The commenter opines that shuttles are not a viable transportation option. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 67

COMMENTER: Steven Evans, Professor, Department of Statistics, UC Berkeley

DATE: March 19, 2019

Response IND 67.1

The commenter voices concern about the proposed demolition of the Upper Hearst parking structure and asks UC Berkeley to reconsider this proposal. Please refer to *Thematic Response: Parking* for further discussion of parking availability and measure to offset the loss of on-site parking. The commenter's request to reconsider demolition of the parking structure does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 68

COMMENTER: Jennifer Teverbaugh, Hearst Mining Building Manager, College of Engineering
Dean's Office, UC Berkeley

DATE: March 20, 2019

Response IND 68.1

The commenter expresses opposition to demolition of the Upper Hearst parking structure and the resulting loss of parking spaces for F and C permit holders. Please refer to *Thematic Response: Parking* for a discussion of additional parking to be provided for such permit holders. The commenter's opinion about the loss of parking does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

The commenter also claims, without providing supporting evidence, that the loss of parking would adversely affect traffic at the intersection of Hearst Avenue and Gayley Road. As discussed on page 168 of the Draft SEIR and *Thematic Response: Traffic*, it is expected that reduced parking availability on-site would result in fewer vehicle trips through this intersection.

Letter IND 69

COMMENTER: Maxina Ventura

DATE: March 20, 2019

Response IND 69.1

The commenter expresses a variety of concerns about UC Berkeley's plans for People's Park. As discussed in *Thematic Response: People's Park*, the proposed Project would not involve development at this park. Therefore, potential changes to the park are outside the scope of the Draft SEIR's environmental analysis of the Project. Nonetheless, while the commenter's opinion about People's Park do not question or challenge the adequacy of the Draft SEIR's environmental analysis, they will be forwarded to UC decision-makers for their consideration.

Letter IND 70

COMMENTER: Christopher O'Dea, Director of Production, Documentary & Production Lab, UC Berkeley

DATE: March 20, 2019

Response IND 70.1

The commenter asserts that the Perimeter/Central Campus Shuttle needs to run every 10 minutes and asks if UC Berkeley is expanding this shuttle due to demolition of the Upper Hearst parking structure. Please refer to *Thematic Response: Parking* for a discussion of expanded shuttle services and parking options.

Letter IND 71

COMMENTER: Peter Hosemann, Professor and Department Chair, Department of Nuclear Engineering, UC Berkeley

DATE: March 20, 2019

Response IND 71.1

The commenter asks for a public hearing on the Draft SEIR during normal working hours. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of UC Berkeley's efforts to notify the community about the Project and its environmental consequences.

The commenter also asks if the public hearings can be recorded. While the public hearings on the Draft SEIR were recorded, complete transcripts of comments at these hearings are available and included in Section 3 of the Final SEIR.

Letter IND 72

COMMENTER: Sabreen Abdelrahman

DATE: March 20, 2019

Response IND 72.1

The commenter states an opinion that UC Berkeley must build housing to accommodate growth in student enrollment. This opinion about the need for housing does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 72.2

The commenter states that students have a right to a safe campus community and requests greater access to emergency services and walkable nighttime environments. This opinion about public safety measures does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 72.3

The commenter states an opinion that bus improvements, bike lanes, electrification of campus, reduction of waste, and carbon neutrality are necessary to offset the adverse effects of enrollment growth. The Draft SEIR analyzes the environmental impacts of UC Berkeley's updated population baseline. The analysis of greenhouse gas emissions determines that Mitigation Measure GHG-1 is required to ensure carbon neutrality, in compliance with UC policies for sustainability.

Letter IND 73

COMMENTER: Samantha Kerns

DATE: March 20, 2019

Response IND 73.1

This comment is virtually identical to Letter IND 72. Please refer to Responses IND 72.1 through 72.3 above.

Letter IND 74

COMMENTER: Sarah Bancroft

DATE: March 20, 2019

Response IND 74.1

This comment is virtually identical to Letter IND 72. Please refer to Responses IND 72.1 through 72.3 above.

Letter IND 75

COMMENTER: Vanya Srivastava

DATE: March 20, 2019

Response IND 75.1

This comment is virtually identical to Letter IND 72. Please refer to Responses IND 72.1 through 72.3 above.

Letter IND 76

COMMENTER: Lesley Emmington

DATE: March 21, 2019

Response IND 76.1

This commenter opines that the Draft SEIR is intended to obfuscate rather than inform the public about the proposed Project. The commenter does not provide specific evidence to support this claim. Nonetheless, while the commenter's opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis, it will be forwarded to UC decision-makers for their consideration.

Response IND 76.2

The commenter asks how the Draft SEIR is compliant with CEQA considering the perceived lack of analysis in the document regarding the increase in student enrollment. The commenter questions the decision to include the amendment to the 2020 LRDP as part of the proposed project and suggests that a separate EIR would be more appropriate. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for an explanation of the rationale for analyzing both the Upper Hearst Development and the updated campus population baseline in the same environmental document.

Letter IND 77

COMMENTER: Lynn Price

DATE: March 21, 2019

Response IND 77.1

The commenter expresses support for the proposed Project. This opinion about the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 78

COMMENTER: Natasha Ham

DATE: March 21, 2019

Response IND 78.1

This comment is virtually identical to Letter IND 72. Please refer to Responses IND 72.1 through 72.3 above.

Letter IND 79

COMMENTER: Neil McClintick

DATE: March 21, 2019

Response IND 79.1

This comment is virtually identical to Letter IND 72. Please refer to Responses IND 72.1 through 72.3 above.

Letter IND 80

COMMENTER: Timothy Etter

DATE: March 21, 2019

Response IND 80.1

This comment is virtually identical to Letter IND 72. Please refer to Responses IND 72.1 through 72.3 above.

Letter IND 81

COMMENTER: Brian Perlman

DATE: March 21, 2019

Response IND 81.1

The commenter expresses concern about parking availability after the proposed demolition of the Upper Hearst parking structure. The commenter asks for plans for improve parking availability. Please refer to *Thematic Response: Parking* for a discussion of substitute parking locations.

Letter IND 82

COMMENTER: Peter Hosemann, Professor and Department Chair, Department of Nuclear Engineering, UC Berkeley

DATE: March 22, 2019

Response IND 82.1

The commenter asks several questions regarding the parking situation and plan for additional parking under the proposed Project, including how the Project addresses housing needs if housing is not below market rate. For this Project, UC Berkeley is committed to working to develop approaches to provide financial relief to certain affiliates, if needed, and is currently exploring an additional subsidy for faculty living at the proposed residential building. Draft SEIR Section 3.3, *Need for the Project*, discusses the need to provide housing on the Project site. The commenter also asks if other locations for expanding GSPP's facilities have been considered. Draft SEIR Section 8, *Alternatives*, evaluates an alternative to the Upper Hearst Development that would involve leasing existing space at an off-site location. In addition, the commenter asks why the parking lot on Ridge Road and Euclid Avenue was not considered for the development. The Draft SEIR's alternatives analysis considers a range of reasonable alternatives to the proposed Project, consistent with the CEQA Guidelines.

The commenter's various other comments and questions are acknowledged, although they do not specifically address the analysis or conclusions of the Draft SEIR. Nonetheless, these questions will be forwarded to UC staff and decision-makers for their consideration.

Letter IND 83

COMMENTER: Charlene Woodcock

DATE: March 23, 2019

Response IND 83.1

The commenter states an opinion that there seems to be a consensus that the scale and aesthetics of the proposed residential building are incompatible with the neighborhood. Please refer to *Thematic Response: Aesthetics* for a discussion of the Upper Hearst Development's significant impact on visual character and quality.

The commenter also expresses support for the Reduced Scale Alternative, provided that its design is sensitive to the context. This opinion about alternatives does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 83.2

The commenter states a concern UC Berkeley has failed to meet its housing needs even as enrollment has exceeded the 200 LRDP's projections. The commenter opines that this has burdened the City of Berkeley to provide housing for additional students. Draft SEIR Section 4, *Relationship to 2020 LRDP*, acknowledges that, as of 2018, UC Berkeley has constructed 1,119 student beds out of the 2,600 beds projected to be built in the 2020 LRDP. Therefore, substantial development capacity for student beds remains under the 2020 LRDP. The commenter's opinions about the need for UC Berkeley-provided housing do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 83.3

The commenter suggests that UC Berkeley freeze enrollment until housing needs are met. This commenter's opinion about enrollment does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 84

COMMENTER: Lisa Titus

DATE: March 23, 2019

Response IND 84.1

The commenter expresses general support for expanding GSPP but also states a concern that the proposed development is too large in scale and poorly designed. Please refer to *Thematic Response: Aesthetics*, which notes that the Draft SEIR finds a significant impact from the proposed development on the neighborhood's visual character and quality.

The commenter adds an opinion that the new buildings would depress property values. Further, the commenter expresses support for the Reduced Scale Alternative with a more "tasteful" design. These opinions about property values and alternatives do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 85

COMMENTER: Marc Rieffel, Professor of Mathematics, UC Berkeley

DATE: March 23, 2019

Response IND 85.1

The commenter expresses concern about parking availability with demolition of the Upper Hearst parking structure. The commenter opines that public transit is an inconvenient option and does not help those who have particularly long commutes. Please refer to *Thematic Response: Parking* for a discussion of parking availability.

Letter IND 86

COMMENTER: R. Robson

DATE: March 23, 2019

Response IND 86.1

The commenter expresses concern about potential housing development at People's Park. As mentioned in *Thematic Response: People's Park*, the proposed Project studied in the Draft SEIR does not include, nor would it directly facilitate, development at People's Park. Such potential development is outside of the scope of the proposed Project considered in the Draft SEIR and therefore was not evaluated as a part of the Draft SEIR.

Letter IND 87

COMMENTER: Edward Frenkel, Professor, Department of Mathematics, UC Berkeley

DATE: March 27, 2019

Response IND 87.1

The commenter objects to the proposed demolition of the Upper Hearst parking structure, asserting that it would place an undue burden on commuters. Please refer to *Thematic Response: Parking* for a discussion of parking availability. The commenter's opinion about the need for parking does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 88

COMMENTER: Jordan Burns

DATE: March 28, 2019

Response IND 88.1

The commenter expresses support for the proposed Upper Hearst Development. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 89

COMMENTER: Kelly Kmak

DATE: March 28, 2019

Response IND 89.1

The commenter expresses opposition to the proposed demolition of the Upper Hearst parking structure, states an opinion that reducing parking would adversely affect the cost of living, benefit few people, and misuse UC Berkeley funds. Please refer to *Thematic Response: Parking* for a discussion of parking availability. The commenter's opinions about the importance of parking do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 90

COMMENTER: Kenneth Ribet

DATE: March 28, 2019

Response IND 90.1

The commenter expresses concern about parking availability after demolition of the Upper Hearst parking structure. The commenter opines that public transit is an inconvenient option and adds to commute times significantly. Please refer to *Thematic Response: Parking* for a discussion of parking availability and measures to offset the loss of parking.

Letter IND 91

COMMENTER: Pulkit Agrawal

DATE: March 28, 2019

Response IND 91.1

The commenter expresses opposition to demolition of the Upper Hearst parking structure, asserting that it would exacerbate a lack of available parking on campus. Please refer to *Thematic Response: Parking* for a discussion of parking availability and measures to offset the loss of parking.

Letter IND 92

COMMENTER: Sean Kitayama

DATE: March 28, 2019

Response IND 92.1

The commenter expresses support for the proposed Project. This opinion about the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision- makers for their consideration.

Letter IND 93

COMMENTER: Maria Folgueras

DATE: March 30, 2019

Response IND 93.1

The commenter expresses support for the proposed Upper Hearst Development. This opinion about the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 94

COMMENTER: Matthew Smith

DATE: April 2, 2019

Response IND 94.1

The commenter asks how demolition of the Upper Hearst parking structure would affect parking availability for S permit holders, and whether any S parking at the Lower Hearst parking structure would be reassigned. As discussed in *Thematic Response: Parking*, the Upper Hearst Development would not affect any parking spaces designated for S permit holders.

Letter IND 95

COMMENTER: Newsha Naderzad

DATE: April 2, 2019

Response IND 95.1

The commenter asks why UC Berkeley plans to demolish the Lower Hearst parking structure. The proposed Upper Hearst Development would not involve demolition of the Lower Hearst parking structure. Please refer to *Thematic Response: Parking* for further discussion of parking availability.

Letter IND 96

COMMENTER: Robert Gable

DATE: April 2, 2019

Response IND 96.1

The commenter asserts that UC Berkeley has been dishonest about student enrollment and requests that it halt all development until negotiating with the City of Berkeley. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 97

COMMENTER: Betsy Foster

DATE: April 2, 2019

Response IND 97.1

The commenter requests that UC Berkeley provide separate CEQA analyses of the Upper Hearst Development and increased campus enrollment. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the reasons for considering both items in the same environmental document.

Letter IND 98

COMMENTER: Margot Smith

DATE: April 2, 2019

Response IND 98.1

The commenter states an opinion that UC Berkeley does not identify the number of faculty and staff necessary to serve the anticipated increase in student enrollment. As shown in Table 4 in Draft SEIR Section 4, *Relationship to 2020 LRDP*, it is projected that the number of UC Berkeley employees would increase from 14,682 in the 2017-2018 school year to 15,355 in the 2022-2023 school year.

Response IND 98.2

The commenter asks how much money UC Berkeley would pay to offset the costs of increased headcount in the city. Please refer to *Thematic Response: Fiscal Impacts* for discussion of payments to the city.

Letter IND 99

COMMENTER: Martin Meeker

DATE: April 2, 2019

Response IND 99.1

The commenter expresses concern about the loss of parking spaces on the Project site and asks how this parking would be replaced. Please refer to *Thematic Response: Parking* for a detailed discussion of the Upper Hearst Development's effect on parking availability and offsets to the loss of on-site parking.

Letter IND 100

COMMENTER: Colin Moore

DATE: April 4, 2019

Response IND 100.1

The commenter expresses opposition to the proposed Upper Hearst Development because of its scale, height, and appearance, and support for the Reduced Scale Alternative. Please see *Thematic Response: Aesthetics* for a response to these comments.

Letter IND 101

COMMENTER: Emily Bruce

DATE: April 4, 2019

Response IND 101.1

The commenter expresses concern about the loss of parking spaces for F permit holders on the Project site. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

The commenter also suggests that UC Berkeley provide compensatory parking for F permit holders on the northeast side of campus. Please refer to *Thematic Response: Parking* for a discussion of parking offsets for F permit holders.

Letter IND 102

COMMENTER: Hawley Holmes

DATE: April 4, 2019

Response IND 102.1

The commenter opines that the proposed Upper Hearst Development is ugly and recommends the Reduced Scale Alternative. Please see *Thematic Response: Aesthetics* for a response to these comments.

Letter IND 103

COMMENTER: Kathleen Weaver

DATE: April 4, 2019

Response IND 103.1

The commenter opines that the proposed building design is unappealing and requests that UC Berkeley consider rethinking its “oversized proportions.” Please see *Thematic Response: Aesthetics* for a response to this comment.

Letter IND 104

COMMENTER: Richard Jackson

DATE: April 4, 2019

Response IND 104.1

The commenter opines that the design and scale of proposed buildings are out of character with the Arts and Crafts style of buildings in North Berkeley. This comment is consistent with the Draft SEIR's analysis, which finds that the Upper Hearst Development would have a significant and unavoidable impact on the setting of nearby historic buildings. However, this impact would be no greater than anticipated in the 2020 LRDP EIR for certain projects that further UC Berkeley's educational mission.

Response IND 104.2

The commenter asserts that the Draft SEIR does not discuss the Upper Hearst Development's effect on traffic in Northside Berkeley neighborhoods.

The Draft SEIR does estimate the Upper Hearst Development's net effect on vehicle trips to and from the Project site, finding that it would result in a decrease in peak-hour traffic near the site because of reduced parking availability on-site. Therefore, the impact on traffic congestion would be less than significant. Although the City of Berkeley Hearst Avenue Complete Streets project was substantially completed in 2017, traffic issues continue to persist in the neighborhood north of the Project site. The Hearst Complete Streets project was designed to improve safety and access on Hearst Avenue from Shattuck Avenue to La Loma Avenue/Gayley Road. UC Berkeley staff is aware of the neighbors' concerns and has met with them as part of this Project. In an effort to encourage motorists to use Hearst Avenue rather than neighborhood streets to the north, the first week of April 1, 2019, the City of Berkeley modified the intersection at Hearst and La Loma avenues with new signal timing by installing a dedicated left-turn signal in the northbound direction to ease the flow of traffic west down Hearst Avenue. Also, in the northbound direction, a dedicated left-turn lane will be painted. Moreover, the new parking structure would be designed with a single driveway on La Loma Avenue that would have a right-turn only exit so that traffic is funneled to the south, away from neighbors. Please refer to *Thematic Response: Traffic* for updated estimates of vehicle trips generated by the Upper Hearst Development.

Response IND 104.3

The commenter states an opinion that UC Berkeley should work to decrease driving and increase public transportation for public health reasons. The commenter recommends increasing the frequency of Bear Transit shuttles and considering opening the Lawrence Berkeley Laboratory shuttles to the greater UC Berkeley community. For a discussion of additional public transportation options that would serve the Upper Hearst Development, please see *Thematic Response: Parking*.

Response IND 104.4

The commenter expresses support for the proposed housing to serve GSPP faculty and their families. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 105

COMMENTER: Kat Sutton

DATE: April 5, 2019

Response IND 105.1

The commenter expresses opposition to the loss of parking spaces for F permit holders due to demolition of the existing Upper Hearst parking structure. The commenter asks how the use of substitute parking locations that require walks up steep slopes, such as the Lower Hearst and Foothill garages, would affect disabled people. The commenter also asks how UC Berkeley plans to offset the loss of parking. Please refer to *Thematic Response: Parking* for a detailed discussion of offset parking for F permit holders, the adequacy of parking access for disabled persons, and plans for offset parking.

Letter IND 106

COMMENTER: Renee Frappier

DATE: April 5, 2019

Response IND 106.1

The commenter expresses concern about the loss of parking for F permit holders on the Project site and asks if UC Berkeley plans to provide additional parking. Please refer to *Thematic Response: Parking* for a discussion of offset parking for F permit holders.

Letter IND 107

COMMENTER: Tamara Gurin

DATE: April 5, 2019

Response IND 107.1

The commenter opines that the proposed Upper Hearst Development would adversely affect the neighborhood's character because it looks "dominating, massive, and incompatible." As discussed in *Thematic Response: Aesthetics*, the Draft SEIR acknowledges that the Upper Hearst Development would have a significant and unavoidable effect on visual character and quality in the surrounding neighborhood because of its scale and design.

Response IND 107.2

The commenter voices support for the Reduced Scale Alternative because of its greater compatibility with historic architecture in the Berkeley Hills. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 107.3

The commenter states an opinion that parking on neighborhood streets in UC Berkeley's environs has become increasingly difficult because of on-street parking by visitors to campus. The commenter expresses concern that the loss of parking spaces near the Greek Theatre and the football stadium would result in greater noise and traffic congestion associated with on-street parking. The commenter also asserts that the proposed Upper Hearst Development would not include alternative parking options. Please refer to *Thematic Response: Parking* for a discussion of the Upper Hearst Development's effect on parking availability and the provision of alternative parking options.

Letter IND 108

COMMENTER: Hillary Hansen

DATE: April 6, 2019

Response IND 108.1

The commenter requests that UC Berkeley select the Reduced Scale Alternative because of its greater compatibility with the scale of surrounding buildings. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 108.2

The commenter expresses concern about the effect of noise generated by activities at the proposed buildings on nearby residents. As discussed in the Draft SEIR, heating, ventilation, and air conditions (HVAC) equipment and outdoor gatherings on the proposed academic building's rooftop terrace would generate noise. However, mechanical equipment would be selected and shielded to ensure noise levels from building operations would be consistent with City of Berkeley Noise Ordinance limits at nearby sensitive receptors. In addition, noise from outdoor events associated with the academic building would not approach the applicable ambient noise standard of 65 dBA Leq., as discussed on page 145 of the Draft SEIR. Therefore, the Draft SEIR finds that on-site noise generated by operation of the proposed buildings would be less than significant.

The commenter also requests consideration of a smaller development to reduce noise. The Reduced Scale Alternative would include the same primary on-site noise sources as the proposed Upper Hearst Development (HVAC equipment and outdoor gatherings at a rooftop terrace) and therefore would generate a similar level of noise from on-site activity.

Letter IND 109

COMMENTER: Lauren Dundes

DATE: April 6, 2019

Response IND 109.1

The commenter asks that UC Berkeley consider reducing the scale of the Upper Hearst Development to be more consistent with the character of the surrounding neighborhood. Please see *Thematic Response: Aesthetics* for a response to this comment. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 110

COMMENTER: Lisa Lum

DATE: April 7, 2019

Response IND 110.1

The commenter expresses opposition to the proposed Upper Hearst Development because of its greater scale and mass than buildings in its historic neighborhood, and its “jarring” stylistic differences from surrounding structures. The commenter urges that UC Berkeley consider the Reduced Scale Alternative to avoid these adverse effects. Please see *Thematic Response: Aesthetics* for a response to this comment. These opinions do not question or challenge the adequacy of the Draft SEIR’s environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 111

COMMENTER: Monique Webster

DATE: April 7, 2019

Response IND 111.1

The commenter expresses support for the Reduced Scale Alternative because of its greater compatibility with the scale and height of nearby structures. Please see *Thematic Response: Aesthetics* for a response to this comment. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 112

COMMENTER: Bettina Lewis

DATE: April 8, 2019

Response IND 112.1

The commenter expresses opposition to the proposed Upper Hearst Development because of its greater scale and mass than buildings in its historic neighborhood, and its “stylistic differences from surrounding structures. The commenter urges that UC Berkeley consider the Reduced Scale Alternative to avoid these adverse effects. Please see *Thematic Response: Aesthetics* for a response to these comments. These opinions do not question or challenge the adequacy of the Draft SEIR’s environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 113

COMMENTER: Christopher Adams

DATE: April 8, 2019

Response IND 113.1

The commenter expresses agreement with comments in letters submitted by the Landmarks Preservation Commission, Henry DeNero, and Daniella Thompson. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 113.2

The commenter opines that the Draft SEIR's project description has provoked confusion about the Project and alternatives. This comment does not provide specific evidence of confusing elements of Draft SEIR Section 3, *Project Description*, so a specific response to the concern is not possible.

Response IND 113.3

The commenter asserts that UC Berkeley failed to conduct adequate public hearings on the Draft SEIR, asserting that it only scheduled a second hearing under pressure and selected inconvenient locations. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of the public hearings.

Response IND 113.4

The commenter claims that the Draft SEIR is a "post-hoc rationalization" of the Project because UC Berkeley presented on the Project at a March 13, 2019, UC Regents meeting that was not noticed to community members. As discussed in *Thematic Response: Noticing and Consultation*, UC Berkeley fully complied with CEQA by scheduling and notifying the community of two public hearings on the Draft SEIR. The presentation to The Regents in March was for informational purposes and is customary University procedure; no approval action was taken by The Regents at that meeting.

Response IND 113.5

The commenter opines that the proposed change in the provision of parking spaces at the rebuilt Upper Hearst parking structure, from approximately 200 to 170 spaces, makes it impossible to evaluate parking impacts. The Final SEIR amends the Draft SEIR's project description to state that the Upper Hearst Development would provide 171 parking spaces in the rebuilt structure. Please note that parking availability in itself is not an environmental impact required for analysis under CEQA. Nonetheless, please refer to *Thematic Response: Parking* for a thorough informational discussion of parking availability.

Response IND 113.6

The commenter claims that the Draft SEIR fails to adequately analyze parking impacts. However, as discussed above, parking availability in itself is not an environmental impact required for analysis under CEQA. Please refer to *Thematic Response: Parking* for an informational discussion of parking availability.

Response IND 113.7

The commenter opines that the Draft SEIR fails to provide adequate mitigation for parking impacts. As discussed in Response IND 113.5, a lack of parking is not an environmental impact that warrant

mitigation. Nonetheless, *Thematic Response: Parking* describes proposed actions to offset the loss of parking due to demolition of the existing Upper Hearst parking structure.

Response IND 113.8

The commenter claims that the Draft SEIR fails to justify why the Project is needed. Draft SEIR Section 3.3, *Need for the Project*, explains the need for the proposed academic and residential buildings. In addition, please refer to *Thematic Response: Need for Academic Building* for further explanation of GSPP's need for the academic building.

Response IND 113.9

The commenter claims that the Draft SEIR fails to justify why the Project is needed. Please refer to Response IND 113.8.

Response IND 113.10

The commenter opines that the Draft SEIR ignores a substantial source of light and glare from the proposed residential building's reflective surface and its roof "with a high solar reflective index." It is acknowledged that reflective surfaces on the exterior of the residential building, including glass windows, would generate some glare from the sun. It should be noted that the roofline of the proposed residential building would exceed the height of nearby residences, so that any solar glare from the roof would not be visible to nearby residents. The commenter also does not present specific evidence that glare from windows would adversely affect residential neighbors of the Project site. Therefore, the Draft SEIR's finding that the Upper Hearst Development would result in a less than significant impact related to light and glare is adequate.

Response IND 113.11

The commenter asserts that the Draft SEIR ignores an "irreversible impact" on shading of rooftop photovoltaic solar panels at the Cloyne Court Student Cooperative building next to the Project site. The commenter claims that both proposed buildings, given their height, would likely cast shadows on these solar panels "much of the time all year and most of the time in winter." Based on this statement, the commenter thinks that the Project would have a significant impact related to energy resources.

The commenter is correct that the Cloyne Court Student Cooperative building has rooftop solar panels. Based on a review of aerial imagery of the Project site and its surroundings, and of the proposed site plans, it is estimated that the existing solar panels would be located as close as approximately 100 feet from the proposed academic and residential buildings. The academic building would have a height of four stories, no taller than the four-story Cloyne Court Student Cooperative. Therefore, this proposed building would not cast shadows on the rooftop of the latter building, even when the sun is low in the sky.

The proposed residential building analyzed in the Draft SEIR would be up to six stories tall, or up to two stories taller than the adjacent Cloyne Court Student Cooperative. Based on its placement to the east and southeast of the Cloyne Court Student Cooperative, it is anticipated that the residential building could cast new shadows on the adjacent rooftop during part of the morning during the fall, winter, and spring, when the sun is positioned at a low angle to the east and southeast. Since publication of the Draft SEIR, UC Berkeley has determined that the residential building would be five stories in height above grade, which would substantially reduce its shading of the four-story Cloyne Court Student Cooperative, relative to the potentially six-story building assumed in the Draft SEIR. Furthermore, the approximate

100-foot setback between the residential building and the solar panels would reduce shading. Furthermore, the new building would not cast shadows on the solar panels when the sun is oriented from due south-southeast to west relative to the Project site. Therefore, it would not cast shadows during the afternoon. It is anticipated that the solar panels would retain most of their existing solar exposure. Therefore, the Project would not have a significant impact related to shading of renewable energy infrastructure.

Response IND 113.12

The commenter asserts that the proposed site plan and renderings shown in the Draft SEIR are inconsistent with the presented residential/parking structure plans and residential building section. The commenter does not identify a specific inconsistency among the plans shown in the Draft SEIR. In the Final SEIR, however, the proposed site plan, renderings, and garage level plans have been updated to show a consistent, up-to-date design for the proposed residential building and rebuilt parking structure. Please refer to Section 4 of the Final SEIR for these updated figures.

Response IND 113.13

The commenter states an opinion that drawings of the proposed buildings are inconsistent with the UC CEQA Handbook. Please note that this publication is outdated, and UC Berkeley no longer applies it to environmental documents as it is in the process of being updated. However, the Draft SEIR's Project description and accompanying drawings are fully consistent with the information required by Section 15124 of the State CEQA Guidelines. Draft SEIR Section 3, *Project Description*, provides a thorough description of the Project's elements and identifies the geographic context of the Project site.

Response IND 113.14

The commenter reiterates that the proposed site plan and renderings shown are inconsistent with other drawings shown in the Draft SEIR. Please refer to Response IND 113.12.

The commenter also asserts that the Draft SEIR lacks mandated elevations of the proposed buildings. The Draft SEIR presents diagrams of the Upper Hearst Development to the extent available at the time of publication. These diagrams and the accompanying text in Section 3, *Project Description*, are sufficient to establish the most conservative potential parameters of the proposed buildings and specify the maximum height that the buildings could reach with respect to the average existing grade. CEQA Guidelines Section 15124 does not require the inclusion of elevation drawings as part of a project description.

Additionally, the commenter claims that the section drawing in Figure 16 of the Draft SEIR is deceptive about the residential building's height at sidewalk level. As discussed on page 2 of the Draft SEIR, "At its maximum height, the residential roofline would be up to approximately 72 feet tall on the Ridge Road (north) side, up to 69 feet on the La Loma Avenue (east) side and up to 87 feet tall on the Hearst Avenue (south) side." This description adequately characterizes the building's height above the average existing grade at different elevations.

Response IND 113.15

The commenter opines that it is hard to believe that proposed residential building's maximum height would differ by only 3 feet at the Ridge Road and La Loma Avenue elevations, given the steep slope south of Ridge Road. However, the commenter does not provide specific evidence that the maximum building heights described in the Draft SEIR are inaccurate. Please refer to the updated rendering of the

residential building in Section 4 of the Final SEIR for a visualization of its elevation along La Loma Avenue.

Response IND 113.16

The commenter asserts that the Draft SEIR does not show the Project design in relation to its surrounding context. However, Figure 2 in the Draft SEIR maps the Project site in relation to important nearby landmarks in Berkeley, and multiple photographs in Figures 3A to 3C and Figures 20 through 24 provide a comprehensive inventory of visual conditions adjacent to all sides of the Project site.

The commenter also estimates that at the corner of La Loma Avenue and Ridge Road, the proposed residential building would be twice the height of the adjacent Foothill Student Housing building and three times that of houses on Ridge Road. Draft SEIR Section 3.1, *Project Location*, describes the heights of adjacent buildings as follows:

The site is bordered on the north by Ridge Road and older, two to three-story modest-sized single-family and multi-family residential buildings across Ridge Road; on the east by La Loma Avenue and the four-story Foothill Student Housing complex; on the south by Hearst Avenue and the approximately four-story Cory Hall within the Campus Park across Hearst Avenue; and on the west by the approximately three-story GSPP buildings and a four-story student housing building (Cloyne Court Student Cooperative).

Since the proposed residential building would be up to six stories in height, it would be approximately three times to height of two-story houses on Ridge Road, as suggested by commenter. However, a six-story building would be less than twice the height of the four-story Foothill Student Housing complex on its La Loma Avenue elevation.

Response IND 113.17

The commenter states an opinion that the proposed buildings fail to meet the Project objective to build facilities that are visually compatible with the surrounding neighborhood. Although it is not within the scope of the Draft SEIR's environmental analysis to evaluate the Project's compatibility with the lead agency's Project objectives, the Draft SEIR's aesthetics analysis acknowledges that the Upper Hearst Development would have a significant and unavoidable impact on visual character and quality. Please refer to *Thematic Response: Aesthetics* for further discussion of this impact. The commenter's opinion about the Project's conformance to its objectives will be forwarded to UC decision-makers for their consideration.

Response IND 113.18

The commenter cites examples of other UC Berkeley buildings with exterior materials that would "significantly mitigate" the residential building's impact while still being contemporary in style. This opinion about appropriate exterior building materials for the Upper Hearst Development does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration. Please also refer to Response A 1.7 for an explanation of Mitigation Measure CUL-1, which would require UC Berkeley to consider modifications to the palette of exterior building materials based on the recommendations of a qualified historic architect.

Response IND 113.19

The commenter asserts that the proposed Upper Hearst Development does not account for an approximately 1,250 square-foot corner at the intersection of Hearst and La Loma avenues where a southbound right-turn lane on La Loma Avenue was converted into landscaping. Expanding the footprint of the residential building into this corner, the commenter contends, would permit additional density and more compatible massing with historical resources. The Upper Hearst Development does include a portion of the additional area where the right turn lane was located. The entrance to the residential building would be located at this corner, as well as new landscaping and a paved walkway to the lobby entrance. As recommended by the commenter, the revised rendering of the residential building in Section 4 of the Final SEIR also shows a more rectilinear design at the corner than assumed in the Draft SEIR.

Response IND 113.20

The commenter claims that the Draft SEIR fails to disclose the presence of several tennis courts at the “La Loma athletic field” on top of the Upper Hearst parking structure. The commenter attaches two photographs of this athletic facility. Although what is currently the La Loma athletic field formerly included tennis courts, page 160 of the Draft SEIR explains that now “several tenants use this space on an infrequent basis under memoranda of understanding with UC Berkeley Recreational Sports including uses such as unmanned aerial vehicle development and rooftop gardening.” This description of existing recreational use at the field is based on conversations with UC Berkeley Recreational Sports. Therefore, the Draft SEIR provides an accurate description of existing conditions at the field

The commenter also opines that the Project is an example of “demolition by neglect,” claiming that UC Berkeley Recreational Sports has failed to maintain the facility. The Draft SEIR acknowledges that the Upper Hearst Development would involve demolition of a recreational resource. However, page 160 of the Draft SEIR notes that:

Consistent with 2020 LRDP Mitigation Measure PUB-4.4, UC Berkeley has analyzed whether the loss of recreational use at La Loma field would result in increased use at other campus facilities to the extent it would result in the physical deterioration of those facilities. Because of the low level of existing recreational demand at La Loma field, UC Berkeley has determined that other facilities can accommodate this demand without causing overuse and physical deterioration of such facilities. New recreational space to compensate for the field’s loss would not be needed.

Pursuant to CEQA Guidelines Section 15125, existing environmental conditions at the time of publishing the Notice of Preparation for an EIR “normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant.” Relative to the existing baseline of a low level of recreational use on-site, the Draft SEIR determines that the Upper Hearst Development would have a less than significant impact related to deterioration of park and recreational facilities.

Response IND 113.21

The commenter contends that omissions and errors in the Draft SEIR’s Project description with regard to building height warrant recirculation of the EIR. As discussed in Response IND 113.14, the Draft SEIR adequately characterizes the height of proposed buildings. Please also refer to Section 4 of the Final SEIR for a set of updated, internally consistent site plans and drawings of the proposed buildings. With this addition, the Draft and Final SEIRs provide an accurate description of building height. UC Berkeley has determined that the comments received on the Draft SEIR do not require the addition of significant new

information that warrant recirculation of the environmental document, pursuant to CEQA Guidelines Section 15088.5. Types of significant new information would include a new significant environmental impact, a substantial increase in the severity of an environmental impact, a potential new feasible alternative or mitigation measure that would clearly lessen the Project's environmental impacts, or a fundamentally inadequate Draft EIR. Because none of these situations apply to the Draft SEIR, recirculation is not warranted.

Letter IND 114

COMMENTER: Henry DeNero

DATE: April 8, 2019

Response IND 114.1

The commenter and multiple other signatories to this letter express opposition to the Upper Hearst Development as proposed. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 114.2

The commenter agrees with the concerns raised by the City's Landmarks Preservation Commission in its letter to UC Berkeley about the Upper Hearst Development. The commenter notes that several additional historic buildings, including the Hatfield House and two homes designed and built by Bernard Maybeck, are located one block north of the Project site. Please refer to Response A 1.1 for a discussion of the Project site's historic context and the Draft SEIR's adequacy in considering this context.

Response IND 114.3

The commenter asserts that the proposed Upper Hearst Development would be too massive, tall, close to streets, and stylistically incompatible with the residential neighborhood. As discussed in *Thematic Response: Aesthetics*, the Draft SEIR acknowledges this adverse effect on the neighborhood's visual character and quality.

Response IND 114.4

The commenter opines that it would be irresponsible to reduce parking availability in an area where parking is already difficult to find and the proposed apartments would further increase parking demand. Please refer to *Thematic Response: Parking* for a discussion of the proposed Upper Hearst Development's effects on parking availability and offsets to the loss of parking on-site. Parking availability in itself is not an environmental issue required for analysis under CEQA.

To increase parking capacity on-site, the commenter suggests excavating the upper corner of the site to add one or two parking levels under the proposed residential building. This suggestion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 114.5

The commenter asserts that reduced parking would exacerbate an existing traffic problem on La Loma and Le Conte avenues. As discussed in *Thematic Response: Traffic*, it is estimated that the proposed Upper Hearst Development would result in lower traffic volumes on nearby streets because of the reduction in parking availability on-site.

Response IND 114.6

The commenter offers a series of suggestions to improve the appearance of the Upper Hearst Development and increase parking availability:

- Lowering the height of the proposed residential building at the corner of La Loma Avenue and Ridge Road while adding height at the interior of the site where the building would be less visible
- Setting the residential building back far enough to plant trees in the setback, while preserving existing mature street trees
- Excavating the corner of the Project site at La Loma Avenue and Ridge Road to add one to two levels of additional parking at or below grade
- Redesigning the residential building to be more compatible with the residential neighborhood's character

These suggestions to redesign the Upper Hearst Development do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 115

COMMENTER: Jenniffer Hamilton

DATE: April 8, 2019

Response IND 115.1

This comment is identical to Letter 112. Please refer to Response IND 112.1 for a discussion of the concerns raised in the letter.

Letter IND 116

COMMENTER: Joel ben Izzy and Taly Rutenberg

DATE: April 8, 2019

Response IND 116.1

The commenters express opposition to the proposed Upper Hearst Development because it would be too large in scale, while blocking existing residential views and reducing parking. To resolve these issues, the commenters recommend a reduced-scale version of the development. Please refer to *Thematic Response: Aesthetics* for a discussion of the proposed residential building's scale relative to the surrounding neighborhood and its resulting effects on visual character and quality. The Draft SEIR analyzes the Upper Hearst Development's effects on scenic views from public vantage points, finding a slight additional obstruction of existing Bay views from the block of Hearst Avenue southeast of the Project site, between La Loma Avenue and Highland Place, which currently offers narrow westward views of the Bay and ridgelines in the North Bay. Please refer to *Thematic Response: Parking* for a discussion of the Upper Hearst Development's effects on parking and offsets to the loss of on-site parking. The commenters' opposition to the proposed development and support for a reduced-scale alternative do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 117

COMMENTER: Karen Nelson

DATE: April 8, 2019

Response IND 117.1

The commenter expresses opposition to the demolition of existing parking on the Project site without providing a new parking structure. As discussed in Draft SEIR Section 2, *Project Description*, although the Upper Hearst Development would involve demolition of the existing Upper Hearst parking structure and Ridge parking lot on the Project site, it would also include a rebuilt Upper Hearst parking structure that would replace some of the parking spaces removed from the site to develop the proposed Project. Please refer to *Thematic Response: Parking* for a discussion of parking availability and substitute parking options in offsite locations.

The commenter adds that offsite parking at the Foothill lot is uphill, with poor lighting and pedestrian paths. This comment does not address safety concerns directly related to the proposed Upper Hearst Development and therefore does not question or challenge the adequacy of the Draft SEIR's environmental analysis. Nonetheless, as discussed in *Thematic Response: Parking*, the Foothill lot is one of several alternative parking locations for commuters to campus, and UC Berkeley is currently assessing options to improve pedestrian safety and access to the Foothill parking lot.

Letter IND 118

COMMENTER: Logan Baldini, Building Manager – Cory Hall, Electrical Engineering and Computer Science

DATE: April 8, 2019

Response IND 118.1

This comment is nearly identical to the text of Letter IND 5 from the same author. Please refer to Response IND 5.1 for a discussion of the commenter's concerns.

Response IND 118.2

The commenter provides a list of questions related to the project, other campus plans and campus operational matters. These questions are generally not comments specifically on the analysis and conclusions of the Draft SEIR, and therefore do not require responses. Please also see *Thematic Response: Parking* for a discussion of parking availability and related transportation issues.

Letter IND 119

COMMENTER: Michelle Chang

DATE: April 8, 2019

Response IND 119.1

This commenter expresses support for the creation of new on-campus housing for graduate students and junior faculty. However, the commenter expresses concern about parking availability, expecting that many spaces in the rebuilt Upper Hearst parking structure would be reserved for residents or other special permits. The commenter also states an opinion that shuttles to the UC Berkeley campus run too infrequently and suggests creating satellite parking for people with long commutes. Please refer to *Thematic Response: Parking* for a discussion of the Upper Hearst Development's effect on parking availability, on the reservation of parking spaces for certain permits, proposed offsets at other parking locations, and additional shuttles.

Letter IND 120

COMMENTER: Sanjay Govindjee

DATE: April 8, 2019

Response IND 120.1

The commenter asserts that the Draft SEIR's traffic study ignores effects on most of the northeastern quadrant of the UC Berkeley campus, including the flow of workers and their ability to commute to campus. Please note that although parking availability is an important policy issue and can be described within an EIR for informational purposes, this is not considered to be an environmental issue requiring analysis and mitigation under CEQA. However, *Thematic Response: Parking* discusses the Upper Hearst Development's effect on parking availability and proposed offsets to the loss of parking in the northeastern part of campus and elsewhere.

Response IND 120.2

The commenter states that the traffic study should assume that proposed housing units would serve faculty and partners who would own cars, adding to the traffic and parking burden. The Upper Hearst Development – Transportation Assessment, included as Appendix F in the Draft SEIR, assumes that new housing units would generate vehicle trips at the rate of off-campus student housing. This is a conservative assumption because faculty housed in the proposed residential building would be located on the edge of the Campus Core and would not typically drive to or from the UC Berkeley campus for work. Therefore, the traffic study provides an adequate analysis of trip generation and parking demand by resident on the Project site.

Response 120.3

The commenter asserts that UC Berkeley has erred by not conferring with College of Engineering faculty about the Upper Hearst Development. As detailed in *Thematic Response: Noticing and Consultation*, UC Berkeley has provided adequate notice of the Project to interested parties during the process of designing the Project and the environmental review process.

The commenter also recommends that UC Berkeley either reject the Upper Hearst Development or find a solution in consultation with interested parties. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 121

COMMENTER: Simone Cherian

DATE: April 8, 2019

Response IND 121.1

The commenter recommends approval of the Reduced Scale Alternative. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 122

COMMENTER: Tom Trippe

DATE: April 8, 2019

Response IND 122.1

The commenter expresses opposition to the Upper Hearst Development for being too massive and out of character with the neighborhood, while supporting the Reduced Scale Alternative for its greater contextual sensitivity. Please refer to *Thematic Response: Aesthetics* for a discussion of the Upper Hearst Development's effects on visual character and quality. The commenter's opinions about the merits of the Project and its alternatives do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 123

COMMENTER: Mary Lee Noonan

DATE: April 8, 2019

Response IND 123.1

The commenter asserts that the Upper Hearst Development would have adverse environmental impacts from the loss of parking and incompatibility with the historic neighborhood. Parking availability in itself is not an environmental issue required for analysis under CEQA. Nonetheless, *Thematic Response: Parking* provides an informational discussion about effects on parking availability. The Draft SEIR acknowledges that the Upper Hearst Development would have a significant and unavoidable impact on historical resources surrounding the Project site.

For the reasons cited above, the commenter expresses opposition to Upper Hearst Development. This opinion about the merits of the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 123.2

The commenter contends that the projected increase in campus headcount is "arbitrary and irrational" because the housing supply is already inadequate for the existing student population. Please refer to Responses ORG 4.1 and ORG 4.17 for a discussion of the rationale for the projected increase in campus headcount.

The commenter asks how the currently strained infrastructure can accommodate additional students. Because the commenter does not provide specific evidence of deficiencies in infrastructure, a specific response is not possible. Please refer to the Draft SEIR's utilities analysis for a discussion of impacts related to water use, wastewater generation, energy use, and related issues.

In addition, the commenter asks if the City of Berkeley has agreed to the proposed revision to the 2020 LRDP to accommodate greater student enrollment. The City has not specifically agreed to this revision. As discussed in the Draft SEIR's Land Use analysis, the UC system is constitutionally exempt from local land use controls whenever using property under its control in furtherance of its educational mission. Therefore, the City's approval is not required when revising UC Berkeley's planning documents. Please note that, as discussed in Responses ORG 4.1 and IND 57.1, UC Berkeley plans to increase student enrollment in accordance with statewide plans to serve California high school graduates. The UC President also engages in an annual process that is publicly available to set enrollment targets in conjunction with the Governor and State legislature.

The commenter also expresses opposition to the proposed 2020 LRDP amendment for updated population projections and asks how UC Berkeley's educational capacity can be increased by one third overnight. UC Berkeley would accommodate increased student enrollment in a phased manner, over a period of several years. The commenter's opinion about the updated population projections does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 124

COMMENTER: Alexandre Bayen, Director, Institute of Transportation Studies, UC Berkeley

DATE: April 9, 2019

Response IND 124.1

The commenter attaches a memorandum prepared by UC Berkeley's Institute of Transportation Studies that critiques the Draft SEIR's traffic study. This memorandum is acknowledged and is responded to below.

Response IND 124.2

The commenter states that the Institute of Transportation Studies has found what it considers major flaws in the Draft SEIR's traffic analysis that require correction. Please refer to the responses below for a discussion of specific comments on the traffic analysis.

The commenter also requests that UC Berkeley involve the Institute of Transportation Studies in amending the traffic analysis. Although the lead agency has determined that it is not necessary to engage in additional consultation on the traffic analysis, the Final SEIR includes responses to specific concerns raised in this letter and revisions to data presented in the traffic analysis where appropriate, as shown in responses below.

Response IND 124.3

The commenter states that the Draft SEIR uses data from an inappropriate time of the academic year to infer typical trip generation rates during the semester when students attend class. As correctly stated in the comment, the Draft SEIR relies on driveway counts at the existing Upper Hearst parking structure collected on May 1, 2018, after the end of the regular session at UC Berkeley. However, traffic data at the Hearst Avenue/La Loma Avenue/Gayley Road intersection, which was used for the intersection impact analysis for the Upper Hearst Development, was collected on April 24, 2018, while UC Berkeley was in regular session.

The driveway counts collected in May 2018 were used to estimate the existing trips generated by the Upper Hearst parking structure. Since the May 2018 counts may not accurately represent the typical traffic generated by the existing parking facility as stated in the comment, new counts were collected at the existing driveways on Wednesday, April 17, 2019, to ensure that the count data reflect UC Berkeley classes in regular session.

In the Final SEIR, the traffic study for the Upper Hearst Development (Appendix F to the Draft SEIR) has been amended to revise the existing driveway counts as well as the estimates of trip generation under the Project. The revised trip generation estimates also account for the updated number of proposed parking spaces in the rebuilt Upper Hearst parking structure (from 200 to 171 spaces). The table below compares the May 2018 and April 2019 traffic volumes entering and exiting the existing Upper Hearst parking structure. The updated April 2019 counts show an increase of 32 percent in the total AM peak hour trips and a decrease of 1 percent in the PM peak hour trips compared to the May 2018 data used in the Draft SEIR.

	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
May 2018 Data	95	4	99	30	103	133
April 2019 Data	120	11	131	19	113	132
Net Difference	+25 (+26%)	+7 (+175%)	+32 (+32%)	-11 (-37%)	+10 (+10%)	-1 (-1%)

In contrast to the May 2018 driveway survey, the April 2019 survey indicates higher trip generation per parking space by the existing Upper Hearst parking structure. Therefore, the proposed decrease in the parking supply on-site would result in a larger net decrease in the net trips generated by the Upper Hearst Development than assumed in the Draft SEIR. Furthermore, as discussed in *Thematic Response: Traffic*, the currently proposed Project would involve the net loss of 29 additional parking spaces than assumed in the Draft SEIR, which would also result in less trip generation by the Upper Hearst Development. Accounting for the more recent driveway survey and fewer parking spaces than initially proposed, the Upper Hearst Development Project is estimated to result in a net decrease of 41 AM and 13 PM peak-hour trips for the project, compared to a net decrease of 15 AM and 5 PM peak hour trips presented in Table 18 in the Draft SEIR. Please refer to *Thematic Response: Traffic* for further discussion of these revised trip generation estimates.

Considering that the net changes result in a larger decrease in trip generation than documented in the SEIR, the Draft SEIR's finding of a less than significant traffic impact from the Upper Hearst Development remains valid.

Response IND 124.4

The commenter asserts that intersection delay increased between 2002 and 2015-2018 during the AM peak hour at 15 of the 29 studied intersections in the UC Berkeley Long Range Development Plan – Trip Generation Comparison (Appendix G to the Draft SEIR), despite the overall decrease in traffic volumes at these intersections. The commenter states an opinion that the increased delay and reduced flow could be an indicator of worse traffic congestion; however, no evidence is provided to support this statement. Most of the studied intersections operate at level of service (LOS) D, which the City of Berkeley considers as the threshold for significant impacts, or better in 2015-2018, as shown in Appendix B of Appendix G to the Draft SEIR. Therefore, although it is unlikely that the decrease in traffic volumes and increase in delay is due to worse traffic congestion at the studied intersections, any increase in delay remains within acceptable levels (LOS D or better) and any impacts would be less than significant..

The increase in delay may be due to other factors, such as the use of different analysis methodology and software since preparation of the 2020 LRDP EIR. The intersection operations analysis completed based on the 2002 counts for the 2020 LRDP EIR was performed using the HCM2000 methodologies and the Traffix software. The majority of the intersection operations analyses for the 2015-2018 data were completed using the HCM2010 methodologies and the Synchro software. These methodologies and softwares use different assumptions and algorithms to estimate delay. For example, the 2020 LRDP EIR analysis did not account for the automobile delay caused by pedestrian and bike volumes at the intersections, while most of the 2015-2018 analyses accounted for the pedestrian and bike volumes, which could account for any differences in calculated delay times at these studied intersections.

Further, the 2015-2018 traffic volumes presented in Appendix G to the Draft SEIR were not used to complete any traffic analysis; they were rather presented to show that the decrease in overall Campus Park trip generation as presented in Table 19 of the Draft SEIR, is consistent with the overall decrease in traffic volumes observed at intersections throughout the City of Berkeley from 2002 to 2015-2018. As noted in the comment, the volume comparison includes intersections adjacent to or near Campus Park that were counted in May, after the end of regular classes at UC Berkeley. Excluding these intersections from the comparison table would not change the conclusion of the SEIR that intersection traffic volumes decreased from 2002 to 2015-2018 and that the total trips generated by the Campus Park decreased from 2002 to 2018.

Response IND 124.5

The commenter asserts that the Draft SEIR incorrectly assumes that the Upper Hearst Development would reduce the overall number of vehicle trips to and from Campus Park. As shown in Table 18 of the Draft SEIR, the proposed reduction in parking spaces on-site would reduce trip generation to and from the Project site. However, this reduction in trips is only applicable to the Project site and its immediate vicinity, and not necessarily applicable to the larger Campus Park area. The Draft SEIR does not imply that the Upper Hearst Development would reduce overall trips to and from Campus Park. Consistent with the 2020 LRDP EIR's approach, the Draft SEIR evaluates the impacts of the proposed development on local intersection operations.

As described in Response to Comment IND 124.3 above, the Upper Hearst Development is estimated to result in a net decrease of 41 AM and 13 PM peak hour trips. These trips would not be made to the Project site or surrounding areas, which would reduce the traffic volumes at intersections near or adjacent to the Project site, and therefore would not substantially deteriorate intersection operations near the Project site during the AM or PM peak hour.

The commenter also asserts that existing trips to and from the Upper Hearst parking structure would be displaced to another parking facility. People displaced from parking at the Upper Hearst parking structure would either park in other UC Berkeley parking lots or structures, in other private or City-operated facilities, or they may change to a non-single-occupant vehicle travel mode. [Incorporate information from other Responses re how UCB will accommodate displaced permit holders.] Considering that the majority of the current regular parkers at the Upper Hearst parking structure purchase parking permits that allow long-term parking, it is unlikely that they would use on-street parking instead because the majority of on-street parking in the vicinity of the project is limited to two-hours or less during weekday business hours. In addition, considering that, as shown in the SEIR (Table 19 and Appendix G), the UC Berkeley-operated parking supply decreased by about 1,130 spaces (about 15 percent) from 2001-2002 to 2016-2017, and during the same period, the drive-alone mode share for all population groups, as well as Campus Park trip generation, decreased, it is reasonable to assume that the elimination of the existing parking spaces at the Upper Hearst parking structure would result in fewer people driving and a net reduction in drive-alone mode share and parking demand campus-wide.

Furthermore, the current parkers at the Upper Hearst parking structure who would park in one of the other UC Berkeley, other private, or City-operated parking facilities would be distributed throughout the greater area surrounding the Campus Park. The impact on any one intersection would be minimal due to the relatively small number of peak-hour trips that would be redistributed, the wide distribution of the re-routed trips, and the fact that many of these trips are already on the street network serving Campus Park.

Response IND 124.6

The commenter states the Draft SEIR does not include a parking study and expresses concern about the loss of parking spaces on-site. In addition, the commenter asserts that the Draft SEIR lacks substantial information about parking plans during construction of the Upper Hearst Development. Parking availability in itself is not an environmental impact that merits analysis under CEQA, but *Thematic Response: Parking* provides additional discussion, for informational purposes, of plans to offset the loss of parking during construction and operation of the Project.

The commenter also opines that a lack of parking can occur during special events. Please refer to *Thematic Response: Proposed GSPP Events Space* for a discussion of parking demand during special events at the proposed academic building.

Response IND 124.7

The commenter asserts that the while Draft SEIR focuses on traffic impacts at the Hearst Avenue/La Loma Avenue/Gayley Road intersection, such impacts would not be limited to one intersection because of increased campus headcount. The Draft SEIR evaluates the impacts of both the Upper Hearst Development and the increase in campus headcount beyond the 2020 LRDP EIR's projections. The Draft SEIR analyzes the Hearst Avenue/La Loma Avenue/Gayley Road intersection to determine the traffic impacts of the Upper Hearst Development, and not those of increased campus headcount.

As described starting on page 167 of the Draft SEIR, the current trips generated by Campus Park and the trip generation estimated for the increased campus headcount in 2022-2023 are below the 2020 LRDP EIR's projections, primarily due to the decrease in driving alone among the different campus population groups between 2002 and 2018. Since Campus Park trip generation in 2022-2023 is estimated to be lower than estimated trip generation for the 2020 LRDP EIR, the Draft SEIR concludes that the population increase would not result in additional environmental impacts beyond those anticipated in the 2020 LRDP EIR related to traffic. Since traffic impacts are directly correlated to trip generation, and the comment does not dispute the assumptions or methodology used to estimate the Campus Park trip generation, the Draft SEIR's conclusion that the population increase would not result in additional traffic related impacts beyond the 2020 LRDP EIR remains valid.

Letter IND 125

COMMENTER: Justin Staller

DATE: April 9, 2019

Response IND 125.1

The commenter expresses support for the proposed Upper Hearst Development including its scale, height, and modern design. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 126

COMMENTER: Juty Blue

DATE: April 9, 2019

Response IND 126.1

The commenter asks UC Berkeley to stop cutting down trees because this contributes to climate change and degrades air quality. As discussed in Draft SEIR Section 2, *Project Description*, the Upper Hearst Development would involve the removal of up to 49 trees within and adjacent to the Project site. Although it is acknowledged that trees sequester carbon and play an important role in mitigating climate change, the loss of up to 49 trees in the regional context would not substantially affect the atmospheric concentration of carbon dioxide and resultant climate change. Furthermore, the Draft SEIR's analysis of biological resource impacts finds that UC Berkeley would be required to replace a removed specimen tree at a 3 to 1 ratio in the closest available sizes to the existing tree. Mitigation Measure GHG-1 also would require the purchase of carbon offsets and/or renewable energy certificates to achieve campus-wide carbon neutrality in direct and indirect greenhouse gas emissions by 2025. With implementation of this mitigation measure, the Upper Hearst Development would not substantially contribute to climate change. The Draft SEIR's analysis of air quality impact also finds that construction and operation of the Upper Hearst Development would not result in concentrations of air pollutants that exceed the Bay Area Air Quality Management District's thresholds to protect human health. Therefore, the impact related to air pollution would be less than significant. Nonetheless, the commenter's support for protecting trees is acknowledged and will be forwarded to UC decision-makers for their consideration.

Letter IND 127

COMMENTER: Charles Pugh

DATE: April 10, 2019

Response IND 127.1

The commenter expresses concern about the loss of parking and asserts that notification of UC Berkeley faculty was untimely and inadequate. The commenter also asks a series of questions about the exact change in parking availability and the provision of permitted parking spaces. Please refer to *Thematic Response: Parking* for a detailed discussion of parking availability and plans to provide substitute parking spaces for certain permittees under UC Berkeley's parking program. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of UC Berkeley's notification of the UC Berkeley community about the Upper Hearst Development.

Letter IND 128

COMMENTER: Daniella Thompson

DATE: April 10, 2019

Response IND 128.1

The commenter asserts that the Draft SEIR fails to provide realistic alternatives to the Upper Hearst Development because the Academic Building Only Alternative and the Reduced Scale Alternative would not be financially feasible. As acknowledged by the commenter, the Draft SEIR also analyzes a No Project Alternative and an Off-site Lease Agreement Alternative, both of which present reasonable alternatives to the proposed development. According to CEQA Guidelines Section 15126.6(a), “[a]n EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project...” As discussed in Draft SEIR Section 8, *Alternatives*, the Academic Building Only Alternative and the Reduced Scale Alternative would both meet these criteria by attaining most of the Project objectives while reducing significant environmental impacts. Alternatives that may prove financially feasible can still merit consideration and analysis in an EIR for the purpose of presenting a reasonable range of alternatives to a project.

Response IND 128.2

The commenter claims that the Draft SEIR’s alternatives were presented in bad faith because UC Berkeley has stated that a public-private partnership would finance the Upper Hearst Development, which would foreclose other financing possibilities. A public-private partnership could finance the Academic Building Only Alternative and the Reduced Scale Alternative or other possible project variations. CEQA does not address financing issues other than in the context of feasibility, which is defined in CEQA Guidelines Section 15364. The Draft SEIR presents a reasonable range of alternatives, consistent with CEQA requirements; nonetheless, this opinion will be forwarded to UC decision-makers for their consideration.

Response IND 128.3

The commenter opines that the Draft SEIR ignores key elements of the historic context, including Daley’s Scenic Park, historic structures that survived the 1923 Berkeley fire, and architectural styles in the neighborhood. Please refer to Response ORG 1 for a discussion of the adequacy of the Draft SEIR’s description of the historic context.

Response IND 128.4

The commenter asserts that the Upper Hearst Development fails to meet the purported Project objective to be “compatible with the surrounding neighborhood.” This opinion does not question or challenge the adequacy of the Draft SEIR’s environmental analysis but will be forwarded to UC decision-makers for their consideration. Also, as detailed in Response A 1.7, please note that Mitigation Measure CUL-1 in the Draft SEIR would require UC Berkeley to consult with a historic architect and consider the architect’s recommendations for a more compatible palette of exterior materials prior to approval of the final design plans for the Upper Hearst Development. Implementation of this mitigation measure would reduce the Upper Hearst Development’s impact on historical resources to the extent feasible, although the Draft SEIR acknowledges that this impact would remain significant and unavoidable.

Response IND 128.5

The commenter states an opinion that the Draft SEIR fails to justify the scale of the proposed academic building. While Draft SEIR Section 2, *Project Description*, summarizes UC Berkeley's need for the project for informational purposes, the CEQA document primarily serves the functions of informing people of the Project's environmental impacts and mitigating these impacts to the extent feasible. Nonetheless, *Thematic Response: Need for Academic Building* provides a more detailed explanation of the need for an approximately 37,000 square-foot academic building.

Response IND 128.6

The commenter opines that the proposed academic building is visually incompatible with the adjacent Beta Theta Pi building. This comment does not conflict with the Draft SEIR, which acknowledges that the Upper Hearst Development would have a significant and unavoidable impact on the visual character and quality of its surroundings. Please refer to *Thematic Response: Aesthetics* for further discussion of aesthetic impacts.

Response IND 128.7

The commenter expresses support for the Reduced Scale Alternative and alteration of the proposed buildings to meet the Project objectives. This opinion about the merits of the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 129

COMMENTER: Lisa Titus

DATE: April 10, 2019

Response IND 129.1

The commenter expresses support for the Reduced Scale Alternative and objects to the proposed Upper Hearst Development due to scale, height, and design. The Draft SEIR acknowledges that the Upper Hearst Development would have a significant and unavoidable impact on the visual character and quality of its surroundings. Please refer to *Thematic Response: Aesthetics* for further discussion of aesthetic impacts. The commenter's opinion about the merits of the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 130

COMMENTER: Carmel Hara

DATE: April 11, 2019

Response IND 130.1

The commenter opines that the Upper Hearst Development seems architecturally incompatible with the surrounding neighborhood. As discussed in *Thematic Response: Aesthetics*, the Draft SEIR acknowledges that the proposed buildings would have a significant and unavoidable impact on the neighborhood's visual character and quality.

Letter IND 131

COMMENTER: Jeff Angell

DATE: April 11, 2019

Response IND 131.1

The commenter asserts that increased enrollment at UC Berkeley would exacerbate existing noise, litter, and parking problems associated with students living in off-campus mini-dorms. The Draft SEIR's analysis of indirect impacts related to population and housing addresses the environmental issues of additional students living off campus, such as noise.

Since 2005, UC Berkeley has established good neighbor relations programs and activities. The Advisory Council on Student-Neighbor Relations, convened in 2005, is dedicated to improving the quality of life in the neighborhoods adjacent to the campus. The Advisory Council focuses on facilitating communication, mutual respect, and cooperation between students and permanent residents to build good student/neighbor relations. Since its inception, the Advisory Council has supported good neighbor initiatives, campaigns and programs that respond to the changing needs of South Side residents including: Cal Move Out, Cal Move In, Happy Neighbors, Every Bear Goes Home and collaborates with health education programs like PartySafe@Cal to engage and serve students and neighbors. Happy Neighbors, for example, is a peer education and outreach program designed to educate students and their neighbors about community expectations, relevant policies and laws, and police and student conduct procedures for possible alcohol, party, and noise-related violations. Additionally, there is part-time UC Berkeley program director dedicated to partnering with the city's Neighborhood Services unit to work with students to adopt good neighbor practices.

Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of these environmental impacts in Berkeley. Parking availability in itself is not an environmental impact that merits analysis under CEQA, but *Thematic Response: Parking* provides additional discussion of this issue for informational purposes.

Letter IND 132

COMMENTER: Joan Angell

DATE: April 11, 2019

Response IND 132.1

The commenter claims that the Draft SEIR finds no adverse effect from an increased student population living in Berkeley's neighborhoods. As student enrollment has grown, the commenter asserts that traffic, living, and "street dumping" have increased. In addition, the commenter asserts that more students are living in sub-standard conditions in min-dorms, and it is harder for non-students to find housing. The Draft SEIR's analysis of impacts related to population and housing acknowledges that increased student enrollment would have additional noise impacts. Concerning trash, sporadic litter problems do not rise to the level of significant aesthetic impact under CEQA. Please refer to Response IND 131.1 for a discussion of good neighbor relations programs and activities established by UC Berkeley. For example, Happy Neighbors is a peer education and outreach program designed to educate students and their neighbors about community expectations, relevant policies and laws, and police and student conduct procedures for possible alcohol, party, and noise-related violations. Another program, Cal Move in and Move Out, was developed in 2007, to bring resources of UC Berkeley and City of Berkeley in an effort to decrease the environmental and social impacts of illegal dumping in near-campus neighborhoods at the start and end of the academic year. The program combines outreach to students and property owners about responsible disposal and reuse strategies as well as the deployment of large debris bins in the student-dense neighborhoods near campus. Please also refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the off-campus effects of increased enrollment.

The commenter opines that the proposed academic building's design, including large conference spaces, may not be appropriate for the Project site. This opinion about the merits of the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 132.2

The commenter asserts that UC Berkeley has been an inconsiderate neighbor and has not adhered to Covenants agreed to when Clark Kerr Campus became a dorm. This opinion about UC Berkeley's historical interactions with the community does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

The commenter adds that additional time is needed for public comment and involvement on the Project. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of UC Berkeley's noticing to and consultation with interested parties.

Letter IND 133

COMMENTER: Kevin Laufer

DATE: April 11, 2019

Response IND 133.1

The commenter states a belief that parking lots are a waste of space considering the lack of space and housing in Berkeley. This opinion about the importance of parking and housing does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 133.2

The commenter suggests that UC Berkeley identify Park & Ride opportunities for commuters to leave cars parked outside Berkeley and take a bus to campus. Please refer to *Thematic Response: Parking* for a discussion of shuttle options available to people who commute by motor vehicle to campus.

Response IND 133.3

The commenter states an opinion that public-private partnerships are a waste of money. In addition, the commenter asks if UC Berkeley or a private developer would own the proposed apartments. The question of ownership of the proposed apartments is acknowledged, but is outside the scope of environmental analysis under CEQA. The commenter's concerns about public-private partnerships do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 134

COMMENTER: Leka Gopal

DATE: April 11, 2019

Response IND 134.1

The commenter notes that parking is currently hard to find and asks what will happen after demolition of the Upper Hearst parking structure. Please refer to *Thematic Response: Parking* for a discussion of parking availability and alternative parking options for commuters to campus.

Response IND 134.2

The commenter asks how removal of the on-site parking spaces would affect revenue to UC Berkeley. This comment is acknowledged, but is outside the scope of environmental analysis under CEQA.

Response IND 134.3

The commenter opines that GSPP does not need as much space as proposed in the Upper Hearst Development. Please refer to *Thematic Response: Need for Academic Building*. The proposed academic building serving GSPP would be adjacent to existing GSPP facilities, satisfying the Project objectives related to academic excellence. In addition, the new building would be sited on an underutilized property.

The commenter also suggests alternate locations for additional academic space. Draft SEIR Section 8, *Alternatives*, evaluates an Off-site Lease Agreement Alternative that would involve increasing GSPP's physical capacity at an off-site location, without redeveloping the Project site. The commenter's support for alternate locations is noted and will be forwarded to UC decision-makers for their consideration.

Response IND 134.4

The commenter asserts that funding for the proposed Upper Hearst Development could be better spent for other purposes. This opinion about the appropriate use of UC Berkeley funds does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 135

COMMENTER: Paulo Monteiro

DATE: April 11, 2019

Response IND 135.1

The commenter expresses dissatisfaction with the proposed removal of parking spaces on the Project site and the availability of substitute parking options or shuttles. Please refer to *Thematic Response: Parking* for a discussion of parking availability, including an updated menu of substitute parking options and shuttles.

Letter IND 136

COMMENTER: Peter Hosemann, Professor and Department Chair, Department of Nuclear Engineering, UC Berkeley

DATE: April 11, 2019

Response IND 136.1

The commenter asserts that removing parking spaces from the Project site would make it harder for economically disadvantaged people to commute to work at UC Berkeley. According to CEQA Guidelines Section 15131, "Economic or social effects of a project shall not be treated as significant effects on the environment." The commenter's opinion about the socioeconomic effects of the Upper Hearst Development does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 136.2

The commenter asks how UC Berkeley would handle retention of employees who commute, including reimbursement for the cost of travel. This comment is acknowledged, but is outside the scope of environmental analysis under CEQA. UC Berkeley does not plan to financially compensate people for altered commutes as a result of the proposed Upper Hearst Development.

Response IND 136.3

The commenter asks how UC Berkeley would address the disproportionate effects of reduced parking availability on lower-income employees. Parking availability in itself is not an environmental issue that warrants analysis under CEQA. Nonetheless, please refer to *Thematic Response: Parking* for an informational discussion of this issue, including measures UC Berkeley is taking to offset the loss of parking, such as making additional spaces available in the nearby Lower Hearst parking structure and Maxwell Family Field and Stadium garage and adding shuttles to the Foothill and Clark Kerr campus parking lots. These measures would help to offset the loss of on-site parking for lower-income employees.

Response IND 136.4

The commenter asks if UC Berkeley or GSPP would compensate people for higher parking costs at other parking locations and for longer commute times. This question is acknowledged, but is outside the scope of environmental analysis under CEQA. As noted in Response IND 136.2, UC Berkeley does not plan to reimburse people for parking costs.

Response IND 136.5

The commenter asks how much rent will cost at the proposed apartments. This comment is acknowledged, but is outside the scope of environmental analysis under CEQA. UC Berkeley anticipates that the new units would be offered at or slightly below market-rate rents. As an auxiliary project that must be self-supporting under the University's policies, rents must be set to cover the development costs for the project. However, UC Berkeley would continue to work to develop approaches to provide financial relief to certain affiliates, if needed, and is now exploring an additional subsidy for faculty living at the proposed residential building.

Response IND 136.6

The commenter asks if GSPP faculty and staff would have reserved parking in remaining parking areas and, if so, why they would receive special treatment. Please refer to *Thematic Response: Parking* for a discussion of dedicated parking spaces at the rebuilt Upper Hearst parking structure and offsite parking locations.

Letter IND 137

COMMENTER: Rehana Kaderali

DATE: April 11, 2019

Response IND 137.1

The commenter requests approval of the Reduced Scale Alternative because of its greater compatibility with the neighborhood. This opinion about the alternative does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 138

COMMENTER: Rhonda Righter

DATE: April 11, 2019

Response IND 138.1

The commenter expresses support for providing more housing for faculty and others, even at the expense of parking. This opinion about the merits of providing additional housing does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 139

COMMENTER: Scott Hart

DATE: April 11, 2019

Response IND 139.1

The commenter expresses support for the proposed demolition of the Upper Hearst parking structure and new academic and residential space. This opinion about the merits of the Upper Hearst Development does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 140

COMMENTER: Alan Bolind

DATE: April 12, 2019

Response IND 140.1

The commenter expresses opposition to the Upper Hearst Development, on the basis that it would reduce parking, fail to solve the housing problem, and waste UC Berkeley's land resources that should go to academic facilities. Please refer to *Thematic Response: Parking* for a discussion of parking availability. The commenter's opinion about the merits of the Upper Hearst Development does not question or challenge the adequacy of the Draft SEIR's analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 141

COMMENTER: Benjamin Brock

DATE: April 12, 2019

Response IND 141.1

The commenter expresses support for reducing parking. However, the commenter would support high-density, low-cost student housing instead of market-rate housing on the Project site. These opinions about the merits of the Upper Hearst Development do not question or challenge the adequacy of the Draft SEIR's analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 142

COMMENTER: Chauru Huang

DATE: April 12, 2019

Response IND 142.1

The commenter asserts that the proposed Upper Hearst Development would be too massive, tall, and poorly designed. As discussed in *Thematic Response: Aesthetics*, the Draft SEIR acknowledges the adverse effect of proposed buildings on the neighborhood's visual character and quality.

The commenter also expresses support for the Reduced Scale Alternative, if designed "with greater sensitivity" to the scale and historic context of the area. This opinion about alternatives does not question or challenge the adequacy of the Draft SEIR's analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 143

COMMENTER: David Shiver

DATE: April 12, 2019

Response IND 143.1

The commenter asserts that the Draft SEIR ignores the adverse visual effect of littering caused by students living off-campus. As supporting evidence, the commenter attaches photographic documentation of litter at two properties occupied by UC Berkeley students. Sporadic litter problems do not rise to the level of a significant aesthetic impact under CEQA. However, please refer to Response IND 131.1 for a discussion of various UC Berkeley programs to minimize the adverse effects of students living off-campus. In addition, please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the effects of additional student enrollment on littering.

Response IND 143.2

The commenter opines that the Draft SEIR understates that adverse effect of nighttime noise caused by additional students living off-campus. Please refer to Responses IND 131.1 and IND 132.1 and *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of noise caused by additional student enrollment.

Letter IND 144

COMMENTER: Doug Buckwald

DATE: April 12, 2019

Response IND 144.1

The commenter asks for a description of steps that UC Berkeley has taken to stabilize enrollment in accordance with the current 2020 LRDP's projections. Please refer to Response 57.1 for a discussion of UC Berkeley's State obligations to accommodate a growing share of high school graduates in California, which prevent placing a cap of student enrollment.

Response IND 144.2

The commenter asks who at UC Berkeley has been responsible for specific measures to limit enrollment and how effective these measures have been. The commenter also asks if any UC Berkeley staff raised concerns about exceeding the 2020 LRDP's enrollment projections and requests that those concerns be reproduced here. These questions are acknowledged, but the topic of prior effort to stabilize enrollment is outside the scope of environmental analysis under CEQA. They will nonetheless be forwarded to UC decision-makers for their consideration.

In addition, the commenter asks if UC Berkeley has a formal review process to ensure compliance with the 2020 LRDP. UC Berkeley monitors implementation of 2020 LRDP mitigation measures through a Mitigation Monitoring and Reporting Program, as required by CEQA; limited student enrollment is not a mitigation measure. Please note that the proposed Project would involve updates to the population baseline in the 2020 LRDP, which would render it consistent with the 2020 LRDP as updated. Furthermore, as discussed in Draft SEIR Section 4, *Relationship to 2020 LRDP*, UC Berkeley remains well below the 2020 LRDP's development envelope for academic space and student beds, and the Project would not result in exceedance of those projections.

Response IND 144.3

The commenter asks what percentage increase in enrollment over a 1998 baseline would UC Berkeley consider "significant." This question is acknowledged, but is outside the scope of environmental analysis under CEQA and will be forwarded to UC decision-makers for their consideration.

Response IND 144.4

The commenter asks if a Supplement EIR should be required to account for "deviations" from 2020 LRDP guidelines. Because the commenter does not identify specific guidelines from which UC Berkeley may have deviated, no specific response is possible.

Response IND 144.5

The commenter asks a series of questions about financial considerations and language in the 2020 LRDP. These questions are acknowledged, but are outside the scope of environmental analysis under CEQA. Nonetheless, they will be forwarded to UC decision-makers for their consideration.

Letter IND 145

COMMENTER: Doug Buckwald

DATE: April 12, 2019

Response IND 145.1

The commenter opines that it is inappropriate to analyze the Upper Hearst Development and the updated population baseline in the same environmental document, and that the Draft SEIR does not adequately address the updated population baseline. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of these issues.

Response IND 145.2

The commenter asks a series of questions about topics unrelated to the Draft SEIR's environmental analysis. These questions are acknowledged, but are outside the scope of environmental analysis under CEQA. Nonetheless, they will be forwarded to UC decision-makers for their consideration.

Letter IND 146

COMMENTER: Doug Buckwald

DATE: April 12, 2019

Response IND 146.1

The commenter expresses opposition to the construction of new student housing. In addition, the commenter lists concerns about the off-campus impacts of UC Berkeley students, including noise and littering, and asks if UC Berkeley will provide real mitigation for these impacts. Sporadic litter problems do not rise to the level of significant aesthetic impact under CEQA. Please refer to Response IND 132.1 and Thematic Response: Environmental Analysis of the Updated Population Baseline for further discussion of the environmental impacts of additional students living off-campus. The commenter's opposition to new student housing does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 147

COMMENTER: Gale Garcia

DATE: April 12, 2019

Response IND 147.1

The commenter opines that the Upper Hearst Development and increased enrollment are entirely separate matters, so their environmental impacts should be analyzed in separate documents. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing these issues in one environmental document.

Response IND 147.2

The commenter asserts that the Draft SEIR ignores the off-campus impacts of increased enrollment. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of these impacts.

Response IND 147.3

The commenter states an opinion that during implementation of the 2020 LRDP mini-dorms have proliferated in Berkeley, resulting in impacts related to noise, traffic, litter on sidewalks, and a loss of public services. Please refer to Response IND 132.1 and *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of these impacts from increased enrollment.

Response IND 147.4

The commenter asserts the increased enrollment under the 2020 LRDP has resulted in displacement of vulnerable populations from off-campus housing, due to the growth in mini-dorms. Please refer to *Thematic Response: Housing* for further discussion of housing displacement due to increased enrollment.

Response IND 147.5

The commenter contends that the Draft SEIR is misleading in attributing increasing student enrollment to UC Berkeley's responsibility to accommodate growth in California's college-age population, asserting that out-of-state students have driven recent enrollment growth. This comment is acknowledged but does not question or challenge the adequacy of the Draft SEIR's environmental analysis; nonetheless, it will be forwarded to UC decision-makers for their consideration.

Response IND 147.6

The commenter asserts that the Draft SEIR's analysis of population and housing impacts does not account for the fact that the updated population baseline includes additional students but fewer employees, even though the 2020 LRDP EIR assumed growth in both populations. The commenter states an opinion that students create more problematic noise than employees. The Draft SEIR acknowledges that increased student enrollment would result in additional noise than anticipated in the 2020 LRDP EIR from students living off-campus. Please refer to Response IND 132.1 and to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of noise impacts from increased enrollment.

Response IND 147.7

The commenter claims that the Draft SEIR compares the increase in campus population to the Bay Area's regional population, but that the more appropriate comparison is to the populations of cities within one

mile of campus. However, pages 149 and 150 of the Draft SEIR do provide a comparison to population projections for the City of Berkeley, as well as to the regional population. This analytical framework is consistent with the 2020 LRDP EIR's approach to population and housing impacts.

Response IND 147.8

The commenter asserts that the Draft SEIR understates the impact of noise generated by additional students living off campus and should provide additional analysis and mitigation. Please refer to Response IND 132.1 and *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of noise impacts from increased enrollment.

Response IND 147.9

The commenter asks what provision of CEQA allows for analysis of two unrelated matters, a physical project and an increase in enrollment "that has already occurred," in one document. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for an explanation of analyzing these issues in one environmental document.

Response IND 147.10

The commenter asks how analyzing the effects of increased enrollment on campus is sufficient for off-campus locations. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of off-campus impacts.

Response IND 147.11

The commenter cites a statement in Page 2 of the Draft SEIR that "the California Environmental Quality Act (CEQA) requires lead agencies to disclose and consider the environmental consequences of proposed discretionary projects prior to taking approval action on such projects." The commenter asks how it is appropriate under CEQA to analyze increased enrollment at this time given that enrollment has already increased. As discussed in *Thematic Response: Environmental Analysis of the Updated Population Baseline*, the increase in student enrollment represents an update to baseline conditions assumed in the 2020 LRDP, rather than a discretionary project that requires independent environmental review under CEQA. Therefore, it is not subject to CEQA requirements pertaining to discretionary projects.

Response IND 147.12

The commenter asks how growth in enrollment "magically" led to a new population baseline. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of how increased enrollment represents a new population baseline.

Response IND 147.13

The commenter cites a statement on Page 3 of the Draft SEIR that "if enrollment increased beyond the projections set forth in the 2020 LRDP, [UC Berkeley] would undertake additional review under CEQA." The commenter asks where this additional review can be found. The Draft SEIR includes this required review, disclosing the impacts of increased population with respect to each environmental resource topic.

Response IND 147.14

The commenter asks how the increased enrollment results primarily from implementation of the California Master Plan for Higher Education, as noted in the Draft SEIR, even though non-resident enrollment is responsible to the increase. Please refer to Response ORG 4.1 for a discussion of this issue.

Response IND 147.15

The commenter asks how it is appropriate under CEQA to ignore the aspects of the enrollment increase that are independent of the Upper Hearst Development. However, the Draft SEIR does include an analysis of the environmental impacts of increased enrollment with respect to each resource topic.

Letter IND 148

COMMENTER: Gladys Block

DATE: April 12, 2019

Response IND 148.1

The commenter opines that the Upper Hearst Development is visually incompatible with the surrounding neighborhood. This comment is consistent with the Draft SEIR's analysis, which as discussed in *Thematic Response: Aesthetics* finds a significant and unavoidable impact on visual character and quality.

Response IND 148.2

The commenter asserts that reducing parking on the Project site would result in increased competition for street parking and related safety issues. Please refer to *Thematic Response: Parking* for discussion of the Upper Hearst Development's effect on parking availability. The commenter does not present specific evidence or detailed comments on the Draft SEIR analysis to demonstrate that increased on-street parking would result in safety issues, so no specific response to this concern is possible.

Response IND 148.3

The commenter urges approval of the Reduced Scale Alternative with a design that is compatible with the neighborhood. This comment does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 149

COMMENTER: Imke de Pater

DATE: April 12, 2019

Response IND 149.1

The commenter expresses opposition to the removal of parking on-site and suggests an alternative of parking under the stadium. This comment does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 150

COMMENTER: Isis Feral

DATE: April 12, 2019

Response IND 150.1

The commenter asserts that the updated population baseline requires more than a supplemental environmental analysis. As discussed in Draft SEIR Section 2.2, *Type of Environmental Impact Report*, a Supplemental EIR is appropriate for the proposed Project and consistent with the criteria listed in CEQA Guidelines Section 15162.

The commenter also opines that the updated population baseline violates prior agreements with the City of Berkeley and would have a major impact on residents. The comment about violation of prior agreements with the City does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the impacts of increased enrollment on off-campus residents.

Response IND 150.2

The commenter claims that construction of the Upper Hearst Development would cause "massive" air pollution. As discussed on Page 66 of the Draft SEIR, construction would not generate emissions of criteria air pollutant that exceed the Bay Area Air Quality Management District's thresholds. Therefore, construction emissions would have a less than significant impact on air quality.

The commenter adds that the proposed buildings would be an "eyesore." Please refer to *Thematic Response: Aesthetics* for a discussion of the Upper Hearst Development's significant impact on visual character and quality. In addition, the commenter claims that proposed LED lighting would increase light pollution and cause a health hazard for certain people with disabilities. However, as discussed on Page 55 of the Draft SEIR, "exterior light fixtures would be designed to direct light downward, which would minimize offsite spillover of light. Exterior lighting control would use a combination of photo sensor and automated time switch to increase energy savings." These features would minimize light pollution and avoid potential associated health effects.

Response IND 150.3

The commenter asserts that increased enrollment is resulting in displacement of existing Berkeley residents. Please refer to *Thematic Response: Housing* for a discussion of displacement caused by increased enrollment.

Response IND 150.4

The commenter expresses opposition to the "expansion and constant growth of UC Berkeley." The opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 150.5

The commenter expresses concern about recent tree removal and future development in People's Park. Please refer to *Thematic Response: People's Park* for a discussion of potential development at that site.

Response IND 150.6

The commenter claims that the Draft SEIR is an attempt to “sneak in increased population numbers” while claiming that no impact would occur. Draft SEIR Section 4, *Relationship to 2020 LRDP*, clearly explains the ongoing increase in UC Berkeley’s student enrollment, and the environmental document analyzes its impacts throughout. Please also refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of the impacts of increased enrollment.

Response IND 150.7

The commenter expresses opposition to any increase of UC Berkeley’s population, further campus development, and tree removal. This opinion does not question or challenge the adequacy of the Draft SEIR’s environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 151

COMMENTER: Jason Simon

DATE: April 12, 2019

Response IND 151.1

The commenter asks a series of questions about the process of planning the Upper Hearst Development, management of the development, and financial considerations. These questions are acknowledged, but their topics are outside the scope of environmental analysis under CEQA. They will nonetheless be forwarded to UC decision-makers for their consideration.

Letter IND 152

COMMENTER: J.M. Sharp

DATE: April 12, 2019

Response IND 152.1

The commenter recommends that UC Berkeley not approve the proposed Minor Amendment to the 2020 LRDP to allow housing on the Project site. This opinion does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

The commenter also recommends that UC Berkeley provide separate analyses of the updated population baseline and the Upper Hearst Development. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing both elements in the same environmental document.

In addition, the commenter recommends recirculation of the Draft SEIR but does not provide specific evidence to support this suggestion. UC Berkeley has determined that the comments received on the Draft SEIR do not require the addition of significant new information that warrant recirculation of the environmental document, pursuant to CEQA Guidelines Section 15088.5. Please refer to Responses A 8.54 and IND 113.21 for further discussion of the requirements for recirculating an EIR.

Response IND 152.2

The commenter asks if the Draft SEIR includes a geotechnical appendix because the proposed residences would sit at the edge of an Alquist-Priolo Special Study Zone. As discussed on Page 96 of the Draft SEIR:

...the Louderback Shear Zone, a 200-foot-wide corridor associated with the Louderback fault, is mapped within the Project site (Appendix D). To investigate whether this fault has been active in the Holocene era (approximately the last 12,000 years), Langan conducted multiple tests of subsurface conditions on the Project site, such as exploratory borings into bedrock and seismic refraction surveys, as well as a comprehensive review of previous studies of faulting in the vicinity of the Project site.

The geotechnical study (Appendix D to the Draft SEIR) was necessary to study whether the Louderback fault trace is active. This study finds that it has not been active in the Holocene era and does not currently pose a hazard of surface rupture.

Response IND 152.3

The commenter asks why the traffic consultant for the Draft SEIR collected vehicle counts at parking garage driveways on May Day last year. In response to this issue, updated vehicle counts were conducted on April 17, 2019. Please refer to *Thematic Response: Traffic* for a discussion of the results.

Response IND 152.4

The commenter asserts that public notification of the public hearings on the Draft SEIR was inadequate and the locations of hearings were far from the Project site. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of public noticing.

Response IND 152.5

The commenter asks why the Draft SEIR does not disclose that the Upper Hearst Development would be “delivered through a public-private partnership and funded through a third-party debt financing structure.” This question is acknowledged, but the topic of financing is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.6

The commenter asks if a UC Irvine student housing project using a public-private partnership was a model for the proposed Upper Hearst Development. This question is acknowledged, but the topic of related public-private partnerships is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.7

The commenter asks questions about the number of enrolled students, faculty, and staff at GSPP and UC Berkeley in 2000 and at the present. Please refer to Table 4 in the Draft SEIR.

Response IND 152.8

The commenter asks how many of GSPP’s current staff and faculty regularly park at “UHPS/L”. This question is acknowledged, but the topic of current parking activity by GSPP employees is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.9

The commenter asks if GSPP fits into the 1990 LRDP “precinct” guidelines. The proposed Upper Hearst Development is subject to the 2020 LRDP’s Location Guidelines, not to those of a prior LRDP.

Response IND 152.10

The commenter asks a series of questions about public hearings on the Draft SEIR:

- Who selected the time and place of the Draft SEIR’s first public hearing?
- Why a location closer to the Project site was not selected?
- Who received hardcopy notice of the public hearing?
- Was the second public hearing was planned in response to complaints from the City of Berkeley?
- Was the noticing procedure for the second public hearing more vigorous than for the first?

Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of public noticing.

Response IND 152.11

The commenter asks how many years of useful life the Upper Hearst parking structure would provide, how often it is inspected for structural problems, and what those inspections cost. The commenter also asks if the existing parking structure has structural flaws, as “reportedly said” by a UC Berkeley Vice Chancellor. These questions are acknowledged, but the topic of the existing parking structure’s integrity is outside the scope of environmental analysis under CEQA. They will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.12

The commenter cites a statement by the GSPP Dean that “it was worth paying \$30,000 for each space that was eliminated.” The commenter asks how this number was derived, if it applies to all parking spaces on campus, and if the price of covered and uncovered spaces differs. The in-lieu fee was negotiated specifically for the proposed Project. The fee-per-lost space was determined to provide funding for future replacement parking at a yet to be determined location. The comments will be forwarded to UC decision-makers for their consideration.

Response IND 152.13

The commenter asks how many F and P permit holders use the UHPS and UHPL facilities. This question is acknowledged, but the topic of current parking activity by certain permit holders is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.14

The commenter asks why the Draft SEIR does not address the issue of faculty and staff retention related to reduced parking availability. The Draft SEIR analyzes the environmental impacts of the Upper Hearst Development. Social impacts such as retention of faculty and staff are outside the purview of environmental analysis, but may be considered separately by decision-makers when reviewing the proposed development.

Response IND 152.15

The commenter asks if the parking structure would cost \$20 million to replace. This question is acknowledged, but financial considerations are outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.16

The commenter asks if reasons cited by signatories to an online petition would be included in the Final SEIR. Consistent with the CEQA Guidelines, this document includes responses to written letters submitted to UC Berkeley during the public review period and to comments provided at two public hearings. It would be outside the scope of the Final SEIR to consider further comments that were not submitted to UC Berkeley in relation to the proposed Project.

Response IND 152.17

The commenter asks how many housing units per acre would be appropriate for the Project site without approval of the Minor Amendment to the 2020 LRDP to allow residential use. Without approval of the proposed Minor Amendment, residential use on the Project would conflict with the 2020 LRDP’s Housing Zone. However, this amendment does not affect how many residential units would be allowed on the Project site. As discussed in the Draft SEIR’s land use analysis, UC Berkeley is constitutionally exempt from local land use regulation, including restrictions on the density of housing units on properties.

Response IND 152.18

The commenter asks if construction could require excavation to a depth greater than the maximum of 23 feet assumed in the Draft SEIR. Based on the proposed site plans, this depth of excavation is the maximum that would occur.

Response IND 152.19

The commenter asks how many cubic feet of grading and debris were removed for the Goldman Annex. This question is not relevant to the Draft SEIR's environmental analysis of the proposed Upper Hearst Development but will be forwarded to City decision-makers for their consideration.

Response IND 152.20

The commenter asks if dewatering machinery would be required permanently on the Project site and how much it would cost. The question about the cost of machinery is acknowledged, but is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration. Please refer to Response A 8.15 for a discussion of the potential for the temporary use of dewatering machinery during construction on the Project site. No permanent dewatering machinery would be required after construction.

Response IND 152.21

The commenter asks if Stanley Hall's subterranean levels "offer any useful guidance for the below-grade parking" proposed on-site. This question is unclear, so a specific response is not possible.

Response IND 152.22

The commenter asks for the carrying capacity of trucks that are likely to be used for material movement during construction. This information is not known at the time, as detailed construction plans for the proposed Upper Hearst Development have not yet been prepared. However, the air quality modeling prepared in CalEEMod for the Draft SEIR makes a default assumption of 20 cubic yards per hauling truck.

The commenter also asks how many truck trips would be necessary for the removal of materials from the Project site. It is estimated that the demolition phase of construction would involve 12 to 20 daily truck trips to remove materials from the Project site. During excavation and shoring of the site, an estimated 80 to 100 daily truck trips would occur initially, followed by an estimated 10 to 25 daily truck trips toward the end of this phase. UC Berkeley would work with the City of Berkeley to develop construction management and routing plans for the Project to minimize traffic and disruption to adjacent neighborhoods.

Response IND 152.23

The commenter asks if construction traffic would be directed along Ridge Road. UC Berkeley would work with the City of Berkeley to develop construction management and routing plans for the Project to minimize traffic and disruption to adjacent neighborhoods. UC Berkeley would complete a Construction Transportation Management Plan (TMP) before construction begins and is to include notification and coordination of the work and traffic impacts on the public right-of-way with the neighboring properties, residences, businesses, and the city.

Response IND 152.24

The commenter asks if construction activity can be required to start after 8 a.m. and before 5 p.m., and if work on weekends would be allowed. As noted on Page 142 of the Draft SEIR, 2020 LRDP Continuing Best Practice NOI-4-a would require that construction "be scheduled within the allowable construction hours designated in the noise ordinance of the local jurisdiction to the full feasible extent, and exceptions will be avoided except where necessary." Therefore, consistent with Section 13.40.070 of the Berkeley

Municipal Code, construction activity would be restricted to daytime hours that are generally outside of normal sleeping hours, i.e., 7:00 A.M. to 7:00 P.M. on weekdays and 9:00 A.M. to 8:00 P.M. on weekends.

Response IND 152.25

The commenter asks if the two redwood trees on-site and adjacent street trees can be saved. As discussed on Page 39 of the Draft SEIR, the Upper Hearst Development would require removal of up to 49 trees, including the redwoods and up to six street trees.

Response IND 152.26

The commenter asks how much of adjacent streets would be closed during construction and for how long. UC Berkeley would work with the City of Berkeley to develop construction management and routing plans for the Project to minimize traffic and disruption to adjacent neighborhoods. UC Berkeley would complete a Construction Transportation Management Plan (TMP) before construction begins and is to include notification and coordination of the work and traffic impacts on the public right-of-way with the neighboring properties, residences, businesses, and the city.

Response IND 152.27

The commenter asks if use of a crane is anticipated during construction. It is anticipated that cranes would be used during the site preparation and building construction phases.

Response IND 152.28

The commenter asks how many workers are likely to drive to the Project site and where they would park. At a maximum, the project would involve up to 100 construction workers a day. Certain phases of construction would require more workers on site while others less. The project would average about 40 workers a day. The contractor would notice workers that parking is limited and some workers may carpool or take public transportation to the project site. Forty parking spaces in the first floor of nearby Maxwell Family Field Stadium Garage would be reserved and made available as paid parking to construction workers for the duration of the project. Also, during construction, when the concrete podium is built separating the garage and residential floors, some temporary parking would be available on site. Construction workers could also park on public streets, but no contractor parking would be allowed in UC Berkeley parking lots other than the Maxwell Family Field and Stadium garage.

Response IND 152.29

The commenter asks if the SEIR will address how the Project would affect on-street parking availability, and if this analysis can include excess demand during special events. Parking availability in itself is not an environmental impact required for analysis in an EIR under CEQA. Therefore, it is outside the scope of the environmental document. However, *Thematic Response: Parking* provides a discussion of parking supply and demand for informational purposes.

Response IND 152.30

The commenter asks if the traffic analysis can be expanded to include nearby residential streets such as La Loma Avenue, Ridge Road, Le Roy Avenue, Le Conte Avenue, and Euclid Avenue. As discussed in the traffic study for the Upper Hearst Development (Appendix F to the Draft SEIR), it is estimated that the development would result in a net decrease in vehicle trips on nearby streets because of reduced parking availability on-site. Therefore, it is not necessary to expand the detailed technical analysis to include additional streets.

Response IND 152.31

The commenter asks if the SEIR will include a shadow study of the Upper Hearst Development. A shadow study has not been prepared for the proposed development. See also Response IND 113.11.

Response IND 152.32

The commenter asks if the SEIR will include additional renderings that show the proposed development in relation to adjacent structures. Figure 18 in the Draft SEIR includes a rendering of the proposed residential building from the perspective of the intersection of Hearst and La Loma avenues. No additional renderings are available at this time for inclusion in the SEIR. However, the Draft SEIR includes a comprehensive series of photographs of adjacent structures along Ridge Road, La Loma Avenue, and Hearst Avenue, which can be compared to the provided rendering. In addition, an updated rendering of the proposed residential building is included in Final SEIR Section 4, *Text Changes to the SEIR*.

Response IND 152.33

The commenter asks if a ground lease with ACC has been signed or when it might be signed, and if a copy can be included in the SEIR. This question about leasing is acknowledged, but is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.34

The commenter asks if ACC has bid or on participated in other UC Berkeley projects, and if student residents at Blackwell Hall pay rent directly to ACC. This question about the public-private partnership is acknowledged, but is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.35

The commenter asks if CHF participates in other projects on or near campus. This question about CHF is acknowledged, but is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.36

The commenter asks if a Basis of Design document has been prepared for the Upper Hearst Development and if it can be included in the SEIR. This question about the Basis of Design document is acknowledged, but is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.37

The commenter asks if UC Berkeley has prepared previous Minor Amendments to the 2020 LRDP. As shown on Page 1 of the Draft SEIR, The Regents previously approved Amendment #1 to the 2020 LRDP to address climate change on July 30, 2009. In May 2011, The Regents approved Amendment #2 to the 2020 LRDP EIR incorporating minor changes to the Campus Space and Infrastructure Chapter. In May 2013, The Regents approved Amendment #3 to the 2020 LRDP EIR addressing the location of the Cal Aquatics Center.

Response IND 152.38

The commenter asks why the Project site was excluded from a list of potential project sites in a June 2018 document prepared by UC Berkeley, titled "Stage 1 Request for Qualifications: UC Berkeley Housing Initiative." This question about a project list in another document is acknowledged, but is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 152.39

The commenter asks if students could afford housing at the proposed residential building. UC Berkeley anticipates that the proposed units would be rented at or near market rates. However, UC Berkeley would continue to work to develop approaches to provide financial relief to certain affiliates, if needed, and is exploring an additional subsidy for faculty living at the proposed residential building.

Letter IND 153

COMMENTER: Jordan Brooks

DATE: April 12, 2019

Response IND 153.1

The commenter expresses support for the Upper Hearst Development. This opinion about the proposed development does not question or conflict with the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 153.2

The commenter expresses concern about the availability of parking for disabled persons. Please refer to *Thematic Response: Parking* for a discussion of alternative ADA-accessible parking options.

Letter IND 154

COMMENTER: Kathleen McGuire

DATE: April 12, 2019

Response IND 154.1

The commenter opines that an in-depth study of the impact of the proposed development and further enrollment increases is necessary and mitigation of adverse effects is necessary. The Draft SEIR provides such a study of the Upper Hearst Development and the updated population baseline.

Letter IND 155

COMMENTER: Laura Schmidt

DATE: April 12, 2019

Response IND 155.1

The commenter asserts that the proposed Upper Hearst Development is too massive, tall, and architecturally incompatible with the historic neighborhood. This comment does not conflict with the Draft SEIR's analysis, which finds that the proposed buildings would be incompatible with the surrounding neighborhood with respect to scale, massing, and exterior building materials, resulting in a significant and unavoidable impact to visual character and quality. Please refer to *Thematic Response: Aesthetics* for further discussion of the Upper Hearst Development's impact on visual character and quality.

Response IND 155.2

The commenter requests approval of the Reduced Scale Alternative with a design that is more sensitive to the neighborhood. This opinion about the alternative does not question or conflict with the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 156

COMMENTER: Lesley Emmington

DATE: April 12, 2019

Response IND 156.1

The commenter opines that UC Berkeley should separate the analyses of the Upper Hearst Development and the updated population baseline. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for included both elements in the same environmental document.

Response IND 156.2

The commenter wonders if it is appropriate for the City of Berkeley to be designated as a responsible agency with permitting or approval authority over the proposed Project. California Public Resources Code Section 21069 defines a responsible agency as “a public agency, other than the lead agency, which has responsibility for carrying out or approving a project.” Because UC Berkeley is constitutionally exempt from local land use authority whenever using property under its control in furtherance of its educational purposes, as noted in the Draft SEIR, the City of Berkeley does not have regulatory authority over the proposed Project and therefore is not listed as a responsible agency in the Draft SEIR.

Response IND 156.3

The commenter asks if UC Berkeley has formally consulted with the City of Berkeley as a responsible agency. Please refer to Response IND 156.2.

Response IND 156.4

The commenter asks if UC Berkeley is powerless as the responsible governmental entity within city limits, and if it is appropriate for UC Berkeley to ignore local land use regulations. Please refer to Response IND 156.2.

The commenter also asks if the Project may proceed despite conflicting with a continuing best practice in the 2020 LRDP related to consistency with local zoning. The Draft SEIR’s land use analysis acknowledges that the Upper Hearst Development would conflict with Continuing Best Practice LU-2-c, resulting in a significant impact related to land use. The UC Regents will take this information into account when deciding whether to approve the proposed Project.

In addition, the commenter asks if UC Berkeley might “prioritize potential financial streams over local zoning laws” to fund the Upper Hearst Development. This question about UC Berkeley’s financial motives does not question or conflict with the Draft SEIR’s environmental analysis but will be forwarded to UC decision-makers for their consideration.

Response IND 156.5

The commenter opines that UC Berkeley’s consultation with the City of Berkeley has been inadequate. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of consultation.

Response IND 156.6

The commenter asks if the Draft SEIR should discuss cumulative impacts on the Adjacent Blocks North area, with regard to parking and stress on electricity and gas supply. The commenter does not provide specific information that questions the adequacy of the Draft SEIR's analysis of dry utilities, so a specific response is not possible.

Response IND 156.7

The commenter asks if UC Berkeley will make a "contractual commitment" for a growth limit on GSPP's future expansion. This question about a contractual commitment is acknowledged, but is outside the scope of environmental analysis under CEQA. It will nonetheless be forwarded to UC decision-makers for their consideration.

Response IND 156.8

The commenter asks if the proposed event space could become a rental site. Please refer to *Thematic Response: Proposed GSPP Events Space* for further discussion of this space.

The commenter also asks why GSPP would not use other available event spaces on campus in lieu of building a new event space, which could allow UC Berkeley to reduce the academic building's height. Please refer to *Thematic Response: Proposed GSPP Events Space* for an explanation of the need for a new event space in the proposed academic building.

Response IND 156.9

The commenter opines that the proposed development is incompatible with the architecture of the surrounding area. Please refer to *Thematic Response: Aesthetics*, which acknowledges the Upper Hearst Development's impact on visual character and quality.

Response IND 156.10

The commenter asks how the community can influence a new design approach. Please refer to *Thematic Response: Noticing and Consultation* for a detailed list of opportunities for interested parties to provide input on the Upper Hearst Development.

Response IND 156.11

The commenter opines that the Draft SEIR provides inadequate analysis of the updated population baseline while focusing on the Upper Hearst Development. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the adequacy of the Draft SEIR's analysis of the updated population baseline.

Letter IND 157

COMMENTER: Norah Foster

DATE: April 12, 2019

Response IND 157.1

The commenter recommends that UC Berkeley move existing trees rather than remove them, or else avoid tree removal by shrinking the footprint of development. These recommendations do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 158

COMMENTER: Reza Alam, Associate Professor, Mechanical Engineering, UC Berkeley

DATE: April 12, 2019

Response IND 158.1

The commenter asks how much rent would cost for the proposed housing units. UC Berkeley anticipates that the proposed units would have rents that are at or slightly below market rate. However, UC Berkeley would continue to work to develop approaches to provide financial relief to certain affiliates, if needed, and is now exploring an additional subsidy for faculty living at the proposed residential building.

The commenter expresses a range of concerns related to parking availability. Please refer to *Thematic Response: Parking* for a discussion of parking availability and measures to offset the loss of parking spaces due to demolition of the existing Upper Hearst parking structure.

The commenter also asserts that some people would use ride-share services instead of driving to campus, as a response to a reduced parking supply. As determined in the traffic study prepared for the Upper Hearst Development (Appendix F to the Draft SEIR), the reduction in parking spaces would cause a net reduction in vehicle trips to and from the Project site. Although reduced parking could induce additional use of ride-share services, it is expected that this effect would not override the reduction in vehicle trips. Therefore, the use of ride-share services would not result in secondary environmental impacts associated with increased vehicle travel.

The commenter also asks other questions that do not address Draft SEIR's environmental analysis. These questions are acknowledged and will be forwarded to UC decision-makers for their consideration.

Letter IND 159

COMMENTER: Ryan Lovett

DATE: April 12, 2019

Response IND 159.1

The commenter expresses concern about the proposed removal of parking spaces on-site and requests that UC Berkeley retain all existing spaces. These suggestions and opinions about parking availability do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

Letter IND 160

COMMENTER: David Romer

DATE: April 15, 2019

Response IND 160.1

The commenter expresses concern about the loss of parking and recommends the addition of new parking spaces to more than offset this loss. This opinion about parking availability does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

The commenter also recommends measures to improve parking access. Please refer to *Thematic Response: Parking* for a discussion of substitute parking options.

Letter IND 161

COMMENTER: Marlena Telvick

DATE: April 15, 2019

Response IND 161.1

The commenter expresses concern about the loss of parking on-site. Please refer to *Thematic Response: Parking* for a discussion of substitute parking options.

3. PUBLIC HEARING TRANSCRIPTS AND RESPONSES

Responses to Transcript PH1: March 12, 2019, Public Hearing

PH 1.1

The commenter expresses concern about the removal of heritage trees at People's Park. Please refer to *Thematic Response: People's Park* for a discussion of potential changes at People's Park. As noted there, the proposed Upper Hearst Development would not affect People's Park, which is located outside of the Project site. Draft SEIR Section 3, *Project Description*, discloses that the Upper Hearst Development would require removal of up to 49 trees within and adjacent to the Project site. This site is located north of Hearst Avenue and west of La Loma Avenue.

PH 1.2

The commenter states an opinion that UC Berkeley should reduce its student enrollment because too many people are already in the area. This opinion does not question or challenge the adequacy of the Draft SEIR's analysis of environmental impacts associated with increasing student enrollment, but it will be forwarded to UC decision-makers for their consideration.

PH 1.3

The commenter expresses concern about removal of the Camperdown elm tree as a character-defining feature of the Beta Theta Pi house. Draft SEIR Section 3, *Project Description*, and Section 6, *Environmental Evaluation*, disclose that construction of the Upper Hearst Development would likely require removal of the specimen Camperdown elm tree to accommodate a new accessible pathway to the proposed academic building. As disclosed in the Draft SEIR, UC Berkeley's Campus Landscape Architect determined in January 2019 that, for its historical value, this tree qualifies as a "specimen tree" under the Campus Specimen Tree Program. If this specimen tree is removed, as anticipated, UC Berkeley would implement Continuing Best Practice BIO-1-a by replacing landscaping where specimen resources are adversely affected. Page 55 of the Draft SEIR goes on to state that because the tree is not visible from a scenic highway, its removal would not constitute an aesthetic impact on a scenic resource within a scenic highway. The Campus Specimen Tree Program would require replacement of this specimen tree at a 3 to 1 ratio in the closest available sizes to the existing tree. By replacing a removed scenic tree with new trees, UC Berkeley would ensure that the Upper Hearst Development would be consistent with the requirements of the Campus Specimen Tree Program.

PH 1.4

The commenter asserts that UC Berkeley and the City of Berkeley have agreed to specific enrollment numbers. This opinion does not question or challenge the adequacy of the Draft SEIR's analysis of environmental impacts associated with increasing student enrollment. Furthermore, no such agreement controlling enrollment exists between UC Berkeley and the City; however, as indicated on page 3 of the Draft SEIR, UC Berkeley stated in Responses to Comments to the 2020 LRDP EIR that if student enrollment exceeded the projections contained in the 2020 LRDP, UC Berkeley would conduct additional environmental review. The Draft SEIR fulfills this commitment.

PH 1.5

The commenter expresses concern that the Draft SEIR is a "green light" for student housing at People's Park. Please refer to *Thematic Response: People's Park* for a discussion of potential changes at People's Park.

As noted there, the proposed Upper Hearst Development would not affect People's Park, which is located outside of the Project site.

The commenter also expresses concern about UC Berkeley's relationship to the city and housing prices. Please refer to *Thematic Response: Housing*; *Thematic Response: Fiscal Impacts*; and *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of UC Berkeley's housing and population in relation to the City of Berkeley setting.

PH 1.6

The commenter expresses concern about potential development at People's Park. Please refer to *Thematic Response: People's Park* for a discussion of potential changes at People's Park. As noted there, the proposed Upper Hearst Development would not affect People's Park, which is located outside of the Project site.

PH 1.7

The commenter expresses concern about the Project's effect on parking availability and its potential effect on employees' quality of life. Please refer to *Thematic Response: Parking* for a discussion of these issues.

PH 1.8

The commenter expresses concern about the Project's effect on parking availability and its potential effect on the campus's environment. Please refer to *Thematic Response: Parking* for a discussion of these issues.

PH 1.9

The commenter recommends that UC Berkeley consider a reduced size project alternative to achieve more neighborhood support. Draft SEIR Section 8, *Alternatives*, does describe and evaluate the environmental impacts of a Reduced Scale Alternative in comparison to the proposed Project. Please refer to *Thematic Response: Aesthetics* for a discussion of the Reduced Scale Alternative's impact on visual compatibility with the surrounding neighborhood. The commenter's opinion does not question or challenge the adequacy of the Draft SEIR's analysis of environmental impacts associated with this alternative, but it will be forwarded to UC decision-makers for their consideration.

PH 1.10

The commenter states that the architectural renderings in the Draft SEIR are unclear and requests clarification of the proposed building heights for the Upper Hearst Development and the alternatives. As discussed in *Thematic Response: Aesthetics*, the currently proposed residential building would be five stories in height. The Draft SEIR evaluates the maximum potential development on-site, with a residential building up to six stories tall. Because the proposed five-story building would be smaller in scale than analyzed in the Draft SEIR, it would not result in additional aesthetic impacts. Section 4 of the Final SEIR includes updated renderings of the residential building.

PH 1.11

The commenter expresses a general concern about increasing enrollment, as well as the overall approach to higher education in the State of California. The commenter's opinion does not question or challenge the adequacy of the Draft SEIR's analysis of environmental impacts but will be forwarded to UC decision-makers for their consideration.

PH 1.12

The commenter expresses concern about the noticing of the public hearing and Draft SEIR document. Please refer to *Thematic Response: Noticing and Consultation* for background information on outreach and public noticing for the Project.

PH 1.13

The commenter expresses concern about the adequacy of the evaluation of cultural resources, as well as stating an opinion that UC Berkeley should be able to design a building that is more compatible with its surroundings. Please refer to *Thematic Response: Aesthetics* for a discussion of the Project's relationship to surrounding neighborhood and historic structures. The Draft SEIR discloses that the Project, as well as the Reduced Scale Alternative, would result in a significant and unavoidable impact on the neighborhood's visual character and quality. The commenter does not state which resources may have been left out of the environmental evaluation; however, the Draft SEIR analysis, page 73, was based on research from the California Historical Resources Information System at the Northwest Information Center, City of Berkeley Public Library, and Historic Structure Reports for Cloyne Court and the Beta Theta Pi house. The commenter's opinion would not change the conclusion from the Draft SEIR's analysis of environmental impacts – that the Project would result in a significant and unavoidable impact to cultural resources – however, it will be forwarded to UC decision-makers for their consideration.

PH 1.14

The commenter expresses concern about potential development at People's Park. Please refer to *Thematic Response: People's Park* for a discussion of potential changes at People's Park. As noted there, the proposed Upper Hearst Development would not affect People's Park, which is located outside of the Project site.

PH 1.15

The commenter states an opinion that the Project's architecture is incompatible with its surroundings and that a reduced scale alternative may be more desirable if designed correctly. Please refer to *Thematic Response: Aesthetics* for a discussion of the Project's relationship to surrounding neighborhood and historic structures. The Draft SEIR discloses that the Project, as well as the Reduced Scale Alternative, would result in a significant and unavoidable impact on the neighborhood's visual character and quality. The commenter's opinion does not challenge the adequacy of the Draft SEIR's analysis of environmental impacts; however, it will be forwarded to UC decision-makers for their consideration.

PH 1.16

The commenter expresses concern that construction of the Project may turn up evidence of cultural resources associated with prior buildings located on the site and that additional mitigation may be required to address potential archaeological finds. Please refer to Response ORG 1.2 for a discussion of handling of archaeological resources if discovered during construction.

PH 1.17

The commenter states an opinion about the size of the Project and its relationship to the neighborhood architecture. Please refer to *Thematic Response: Aesthetics* for a discussion of the Project's relationship to surrounding neighborhood and historic structures. The commenter's opinion does not question or challenge the adequacy of the Draft SEIR's analysis of environmental impacts, but it will be forwarded to UC decision-makers for their consideration.

PH 1.18

The commenter expresses concern that the City of Berkeley Hearst Avenue Complete Street project has diverted traffic onto Le Conte Avenue. The Hearst Avenue Complete Streets project was substantially completed in 2017 and underwent its own traffic analysis and environmental review. Because this project was complete at the point when the proposed Project's environmental analysis began, it was part of baseline conditions assumed in the Draft SEIR and does not constitute new information. Nevertheless, measures to minimize traffic to residential neighborhoods have recently been put in place and would also be incorporated into the Project. In an effort to encourage motorists to use Hearst Avenue rather than neighborhood streets to the north, the first week of April 1, 2019, the City of Berkeley modified the intersection at Hearst and La Loma avenues with new signal timing by installing a dedicated left-turn signal in the northbound direction to ease the flow of traffic west down Hearst Avenue. Also, in the northbound direction, a dedicated left-turn lane will be painted. Moreover, the new parking structure would be designed with a single driveway on La Loma Avenue that would have a right-turn only exit so that traffic is funneled to the south, away from neighbors to the north. As discussed in *Thematic Response: Traffic*, the placement of a driveway to the rebuilt Upper Hearst parking structure on La Loma Avenue would not adversely affect traffic circulation, and the Upper Hearst Development would have a less than significant impact on the performance of the circulation system.

PH 1.19

The commenter expresses an opinion that the neighborhood would benefit from additional housing for year-round residents. Please refer to *Thematic Response: Housing* for a discussion of the Project's effects related to housing. Although the commenter's opinion does not question or challenge the adequacy of the Draft SEIR's analysis of environmental impacts, it will be forwarded to UC decision-makers for their consideration.

PH 1.20

The commenter expresses concern about potential development at People's Park and the potential environmental effects of housing more students and UC Berkeley business operations. Please refer to *Thematic Response: People's Park* for a discussion of potential changes at People's Park. As noted there, the proposed Upper Hearst Development would not affect People's Park, which is located outside of the Project site.

PH 1.21

The commenter expresses concern that the City of Berkeley Hearst Avenue Complete Street project has diverted traffic onto Le Conte Avenue. Please refer to Response PH 1.18 for a discussion of recent and ongoing measures to reduce traffic on residential streets near the Project site.

PH 1.22

The commenter expresses concern regarding the size and aesthetics of the proposed Project and questions the need for additional academic space for the Goldman School and for additional housing. The commenter also has a concern about the financial model for the project, which is an economic issue outside the purview of CEQA. Please refer to *Thematic Response: Aesthetics* for a discussion of the Project's relationship to surrounding neighborhood and historic structures. The Draft SEIR discloses that the Project, as well as the Reduced Scale Alternative, would result in a significant and unavoidable impact on the neighborhood's visual character and quality. Please refer to *Thematic Response: Proposed GSPP Events Space* and *Thematic Response: Housing* for discussions of the need for additional academic space and

housing. The commenter's opinions do not challenge the adequacy of the Draft SEIR's analysis of environmental impacts, but will be forwarded to UC decision-makers for their consideration.

Responses to Transcript PH2: March 21, 2019, Public Hearing

PH 2.1

The commenter expresses concern about the removal of trees at People's Park. Please refer to *Thematic Response: People's Park* for a discussion of potential changes at People's Park. The proposed Upper Hearst Development would not affect People's Park, which is located outside of the Project site.

The commenter also expresses concern that the Draft SEIR mentions the removal of 22 trees, and notes that the trees should not be removed. The commenter is specifically concerned over the removal of a Camperdown elm tree and two redwoods. Please refer to Response PH 1.3 for a discussion of removal of the Camperdown elm tree. As discussed on page 72 of the Draft SEIR, the two redwoods "do not meet UC Berkeley's historical, educational, or aesthetic criteria to be considered 'specimen trees.'" Therefore, replacement of these trees would not be required under UC Berkeley's Specimen Tree Program. Although the commenter's concern about tree removal does not challenge the adequacy of the Draft SEIR's analysis of environmental impacts, it will be forwarded to UC decision-makers for their consideration.

The commenter recommends redesigning the Project and expresses concern about the loss of parking spaces. Please refer to *Thematic Response: Parking* for a discussion of parking availability. The commenter's opinions about the Project (or alternatives) do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.2

The commenter expresses support for the proposed Project. This opinion about the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.3

The commenter discusses the need for the proposed Project and expresses support for the Project. This opinion about the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.4

The commenter expresses support for the proposed Project. This opinion about the Project (or alternatives) does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.5

The commenter expresses support for the proposed Project. This opinion about the Project (or alternatives) does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.6

The commenter expresses support for the proposed Project. This opinion about the Project (or alternatives) does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.7

The commenter opines over the location maps in the SEIR, and raises issues regarding the scope of the impact analysis with respect to the location maps. Figure 1 (Regional Location) and Figure 2 (Project Location) in the Draft SEIR are fully adequate for the purpose of visualizing the Project site and its vicinity, and characterizing the context of the Project site. Figure 1 shows the regional context of the site in Berkeley and the greater Bay Area, and Figure 2 shows the Project site and important nearby land uses and roadways. Consistent with CEQA Guidelines Section 15124, these figures are sufficiently detailed to help analyze the environmental impacts of the Upper Hearst Development in this setting.

PH 2.8

The commenter expresses concern about staff working at Berkeley and living in distant places, increasing their commute time and parking. The commenter points out issues regarding poor public transportation, parking availability and, removal of parking spaces, and the effect on people commuting for long distances and searching for parking spaces. Please refer to *Thematic Response: Parking* for a discussion of these issues.

PH 2.9

The commenter expresses concern on the inclusion of the minor amendment to the 2020 LRDP in the Draft SEIR. The commenter points out that the development project and the amendment should be studied and evaluated separately. A Minor Amendment to the 2020 LRDP is required to allow residential use at the Project site. Without approval of the proposed Minor Amendment, residential use as part of the Upper Hearst Development would conflict with the 2020 LRDP's Housing Zone. Therefore, it is necessary for UC Berkeley to analyze both aspects of the Project together. The commenter notes the impact of additional students on the City of Berkeley. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing the updated campus population baseline in the Draft SEIR.

PH 2.10

The commenter expresses support for the expansion of the Goldman School, and for a four-story design for both the academic and housing proposal. Please refer to *Thematic Response: Aesthetics* for a discussion of the Reduced Scale Alternative or a project limited to three or four stories in height. The commenter's support for the Reduced Scale Alternative and request for a redesigned Upper Hearst Development that is more compatible with historical resources are noted and will be forwarded to UC decision-makers for their consideration.

PH 2.11

The commenter expresses need for more analysis of the proposed event space. Please refer to *Thematic Response: Proposed GSPP Events Space* for further discussion.

PH 2.12

The commenter expresses concern about increased enrollment and the fact that enrollment figures have increased from the 2020 LRDP's projections. This opinion does not question or challenge the adequacy of the DSEIR's analysis of environmental impacts associated with increasing student enrollment, but it will be forwarded to UC decision-makers for their consideration.

PH 2.13

The commenter provides a comment regarding the UC endowment committee and why money raised is not being spent on building more student housing. This opinion about financial issues does not question or challenge the adequacy of the DSEIR's analysis of environmental impacts, but it will be forwarded to UC decision-makers for their consideration.

The commenter also expresses concern over impacts from the increase in enrollment. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of these issues.

PH 2.14

The commenter reads a poem on People's Park. This comment does not question or challenge the adequacy of the Draft SEIR's environmental analysis. Please refer to *Thematic Response: People's Park* for a discussion of potential changes at People's Park.

PH 2.15

The commenter discusses the need for and expresses support for the proposed Project. This opinion about the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.16

The commenter expresses support for the proposed Project. This opinion about the Project does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

The commenter also expresses concern on the parking impact. Please refer to *Thematic Response: Parking* for a discussion of this issues.

PH 2.17

The commenter expresses concern on enrollment growth and its impacts to the students, and the city. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of these issues.

PH 2.18

The commenter expresses concern regarding the size and aesthetics of the Proposed Project, as well as concern about the need for the Project. The commenter also has a concern about the financial model for the Project. Please refer to responses to Letter IND 128 and *Thematic Response: Aesthetics* for a discussion of the Project's relationship to surrounding neighborhood and historic structures. Analyzing the need for certain space in the proposed academic building is outside the scope of the Draft EIR's study of environmental impacts; however, please refer to *Thematic Response: Proposed GSPP Events Space* for further discussion of the need for an events space in the academic building. The Draft SEIR analyzes reduced building heights under the Reduced Scale Alternative. The commenter's support for a reduced-scale alternative does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.19

The commenter expresses concern about the public noticing of the Project and parking availability. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of public noticing of the Project and *Thematic Response: Parking* for a discussion of parking availability.

PH 2.20

The commenter opines over the need for transparency and public outreach. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of public noticing of the Project.

The commenter also questions the viability of the funding model for this Project. Please refer to *Thematic Response: Fiscal Impacts* for a discussion of this issue.

PH 2.21

The commenter expresses concern over how parking affects the adjacent neighborhood. The commenter further requests recirculation of the Draft SEIR. Please refer to *Thematic Response: Parking* for a discussion of parking availability. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of public noticing of the Project. UC Berkeley has determined that recirculation of the Draft SEIR is not warranted. Please refer to Responses A 8.54 and IND 113.21 for further discussion of the requirements for recirculating an EIR.

PH 2.22

The commenter expresses concern over People's Park. Please refer to *Thematic Response: People's Park* for a discussion of potential changes at People's Park. The proposed Upper Hearst Development would not affect People's Park, which is located outside of the Project site.

PH 2.23

The commenter expresses concern over issues on access to housing for students and the associated increase of housing prices with the increase in the regional economy. The commenter expresses support for the proposed housing development and for a taller building. The commenter also notes that the parking may be retained or reduced. These opinions about the Project (or alternatives) do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration. Please refer to *Thematic Response: Parking* for a discussion of issues in parking.

PH 2.24

The commenter expresses concern over the removal of parking spaces. Please refer to *Thematic Response: Parking* for a discussion of loss of parking spaces.

The commenter states that a collective letter representing 250 faculty, 5,000 students and several hundred of the staff members will be sent to the Chancellor Carol Christ and other higher administration. This comment is noted. Although the prospective letter was not received during the Draft SEIR's public review period, UC Berkeley will review it separately upon receipt.

Further, the commenter has requested that the administration meet with the faculty and staff from College of Engineering during regular business hours. In response to comments by staff and faculty to meet with upper administration to discuss the Project, the Chancellor met with College of Engineering faculty the afternoon of April 12, 2019, and again on April 22, 2019, for a town hall meeting.

PH 2.25

The commenter expresses support for the proposed Project and for additional student housing. The commenter also supports the reduction in parking spaces, noting the alternative use of bike racks, walking trails and shuttle buses to UC Berkeley affiliates. This opinion about the Project (or alternatives) does not question or challenge adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.26

The commenter recommends severing the analysis of the updated population baseline from the analysis of the proposed Upper Hearst Development project. Please refer to Response A 5.1 and *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing the updated population baseline in the Draft SEIR. The commenter also expresses multiple concerns about the impacts of increased student enrollment on the off-campus environment. The Draft SEIR provides a thorough analysis of these impacts with respect to each resource topic under CEQA. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for further discussion of off-campus environmental impacts from increased enrollment

PH 2.27

The commenter opines that UC Berkeley take responsibility for the growth of students and the need for affordable student housing near campus. The commenter also expresses multiple concerns about the impacts of increased student enrollment on the off-campus environment. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of these issues, and refer to *Thematic Response: Housing* for a discussion of affordable student housing availability.

PH 2.28

The commenter expresses opinion about the financial impacts of demolishing the Upper Hearst parking structure. This opinion about financial impacts is acknowledged, but is outside the scope of the Draft SEIR's environmental analysis under CEQA. This comment will be forwarded to UC decision-makers for their consideration.

PH 2.29

The commenter expresses concern over the Project's effects including the removal of parking spaces, a purported increase in traffic, and people commuting for long distances and searching for parking spaces. Please refer to *Thematic Response: Parking* for a detailed discussion of parking availability and substitute parking options. Please refer to *Thematic Response: Traffic* for a discussion of the Project's traffic impacts.

PH 2.30

The commenter opines that the increase in population violates an agreement between UC Berkeley and the City of Berkeley. This opinion does not question or challenge the adequacy of the Draft SEIR's analysis of environmental impacts associated with increasing student enrollment. The commenter also expresses concern over the increase in student population at UC Berkeley, noting that this does not take into account the number of faculty and staff to service the increase in student enrollment. As shown in Table 13 in the Draft SEIR, UC Berkeley projects 1,228 fewer employees for the 2022-2023 academic year than anticipated in the 2020 LRDP. Therefore, the Draft SEIR's analysis of the updated population baseline does account for change of faculty and staff populations.

Further, the commenter notes that increase in growth should take into consideration the whole of the environment. The Draft SEIR informs the public that population growth, in and of itself, is not an environmental impact. However population growth may contribute to an increase in impacts to other topical areas (Draft SEIR, page 45). Please refer to responses to Letter IND 98 and *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of these issues.

PH 2.31

The commenter recommends severing the analysis of the updated population baseline from the SEIR. Please refer to Responses IND 38, 76 and 156, and *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing the updated population baseline in the Draft SEIR.

PH 2.32

The commenter recommends severing the analysis of the updated population baseline from the SEIR. Please refer to Responses IND 38, 76 and 156, and *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing the updated population baseline in the Draft SEIR.

PH 2.33

The commenter expresses concern over an increase in student population and advocates for separate analysis and discussion. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of these issues.

The commenter further urges that UC Berkeley and the City of Berkeley accommodate lighting, public transit, and student housing. These recommendations about the Project do not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.34

The commenter expresses concern about the Project's effect on the residents living in the residential neighborhood, view obstruction, and parking issues. The commenter contends that the Project and Draft SEIR should address the impact of crime in the area. Please refer to *Thematic Response: Aesthetics* for a discussion of the proposed Project's and the Reduced Scale Alternative's visual impacts on the surrounding neighborhood. Please refer to *Thematic Response: Parking* for a discussion of parking availability. The opinion about public safety measures does not question or challenge the adequacy of the Draft SEIR's environmental analysis but will be forwarded to UC decision-makers for their consideration.

PH 2.35

The commenter recommends severing the analysis of the updated population baseline from the SEIR. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of the rationale for analyzing the updated population baseline in the Draft SEIR.

The commenter also contends that the Project would violate UC Berkeley's agreement with the City of Berkeley. No such agreement controlling enrollment exists between UC Berkeley and the City.

PH 2.36

The commenter opines on the lack of outreach and student involvement in the Project. Please refer to *Thematic Response: Noticing and Consultation* for a discussion of the adequacy of public noticing of the Project.

The commenter also expresses concern over access to housing for students, staff and faculty. Please refer to *Thematic Response: Housing* for a discussion of issues of UC Berkeley's housing.

PH 2.37

The commenter expresses concern regarding about parking availability. Please refer to *Thematic Response: Parking* for further discussion.

PH 2.38

The commenter expresses concerns about impacts to emergency services and other services due to increased student enrollment on the off-campus environment. The commenter also is concerned about the need for more housing and additional funding. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline*, and *Thematic Response: Housing* for a discussion of these issues.

PH 2.39

The commenter opines on the increase in enrollment and impact on public services. Please refer to *Thematic Response: Environmental Analysis of the Updated Population Baseline* for a discussion of these issues.

PH 2.40

The commenter expresses concerns about the proposed Project's relationship to the historic structures in the neighborhood and the City of Berkeley. Please refer to *Thematic Response: Aesthetics* for a discussion of the Project's relationship to surrounding neighborhood and historic structures. The Draft SEIR discloses that the Project, as well as the Reduced Scale Alternative, would result in a significant and unavoidable impact on the neighborhood's visual character and quality.

4. TEXT CHANGES TO THE DRAFT SEIR

Section 4 presents specific changes to the text of the Draft SEIR that are being made to correct errors or omissions or clarify information presented in the Draft SEIR in response to comments received during the public review period. In no case do these revisions result in a greater number of impacts or impacts of a substantially greater severity than those set forth in the Draft SEIR. Where revisions to the main text are called for, the page section number are set forth, followed by the appropriate revision. Added text is indicated with underlined text. Text deleted from the Draft SEIR is shown in ~~strikeout~~. Page numbers correspond to the page numbers of the Draft SEIR.

Page 2 in Draft SEIR Section 1.1, *Project Summary*, is revised in the Final SEIR as follows:

As a result of removing existing parking areas, it is assumed that the Upper Hearst Development would reduce the total number of parking spaces on-site from 407 to ~~approximately 200, including 175~~ 171 marked parking spaces ~~and 25 attendant parking spaces~~. One driveway from La Loma~~Hearst~~ Avenue would provide vehicular access to the parking garage.

Page 3 in Draft SEIR Section 1.1, *Project Summary*, is revised as follows:

The academic building's event space would ~~have a seating capacity of 300 and would~~ accommodate up to ~~301~~450 visitors at maximum capacity; public and private events would occur periodically during both daytime and evening hours but it is anticipated that events would reach full capacity only a couple of times per year.

Page 19 in Draft SEIR Section 3.5, *Project Description*, is revised as follows:

It is anticipated that the Upper Hearst Development would accommodate up to approximately ~~1,027~~1,176 occupants, including up to 301~~approximately 300 people seated and up to 450~~ occupants at maximum capacity in the academic event space; public and private events in this space would occur periodically in the day and evening.

Pages 21 to 23 in Draft SEIR Section 3.5, *Project Description*, are revised to present the following updates to Figure 5 (Garage Level 1 Floor Plan), Figure 6 (Garage Level 2 Floor Plan), and Figure 7 (Garage Level 3 Floor Plan):

FIGURE 5 GARAGE LEVEL 1 FLOOR PLAN

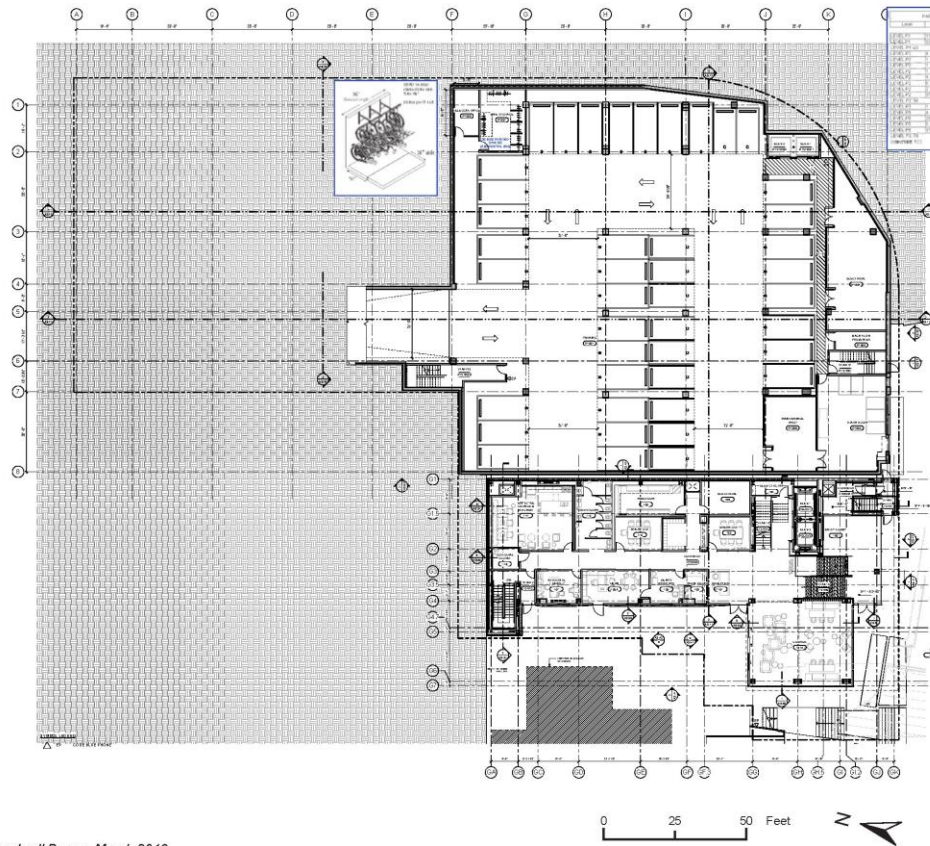
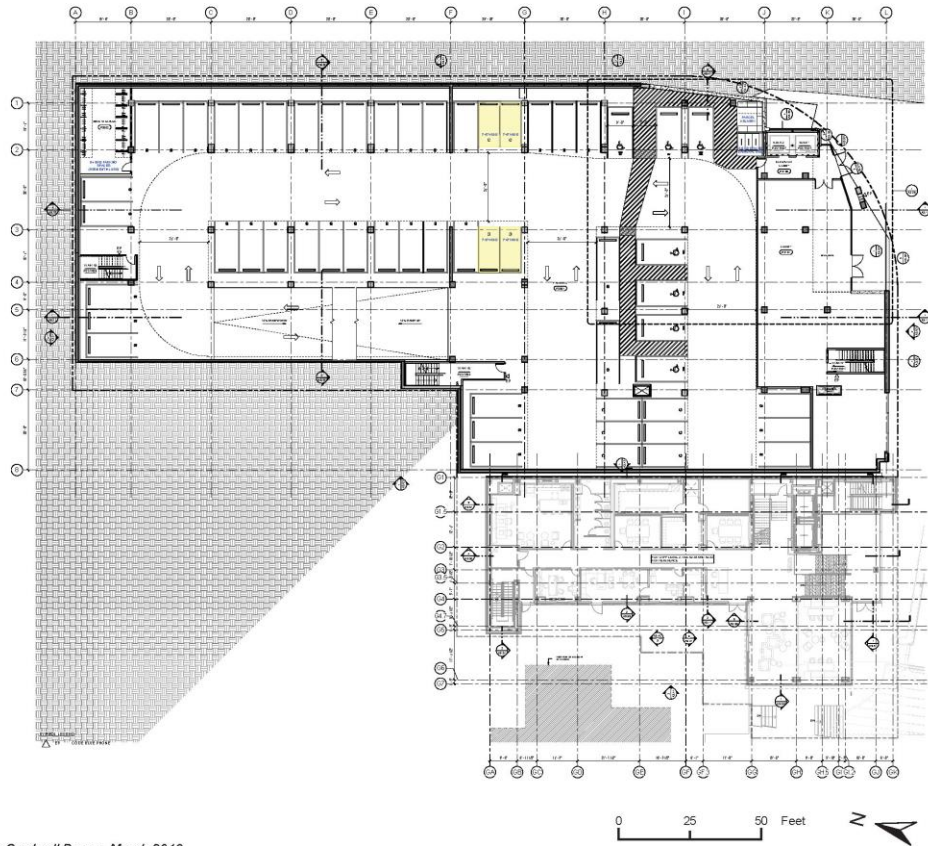
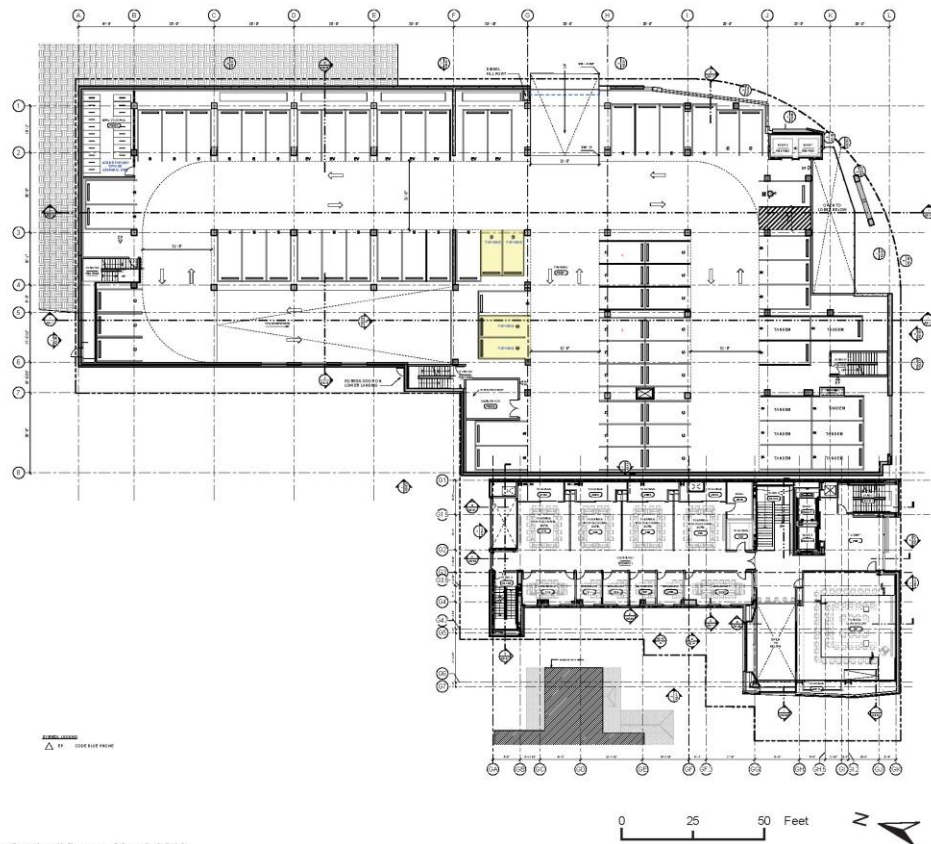


FIGURE 6 GARAGE LEVEL 2 FLOOR PLAN



Source: Solomon Cordwell Buenz, March 2019

FIGURE 7 GARAGE LEVEL 3 FLOOR PLAN

Source: Solomon Cordwell Buenz, March 2019

Page 35 in Draft SEIR Section 3.5, *Project Description*, is revised with the following rendering of the proposed residential building:

FIGURE 18 ARCHITECTURAL RENDERINGS

Page 37 in Draft SEIR Section 3.5, *Project Description*, is revised as follows:

**Table 2:
Estimated Project Occupancy**

Use	Size	Occupancy Rate	Occupants
Residences	225 bedrooms	1 person/bedroom	225
Residential amenity space	1,250 sf	1 person/100 sf	13
Academic offices	9,090 sf	1 person/100 sf	91
Academic classrooms	5,950 sf	1 person/ 15 sf	397
Academic event space	3,150 sf	1 person/7 sf	301 450 ¹
Total			<u>1,027</u>,176

¹ Estimated occupancy of academic event space including standing room for ~~300~~450 people.

Source: Solomon Cordwell Buenz, ~~April 2019~~May 2018

Page 38 in Draft SEIR Section 3.5, *Project Description*, is revised as follows:

It is anticipated that the event space would accommodate up to ~~301~~300 people seated and 450 visitors at maximum capacity.

Page 38 is also revised as follows:

As a result of removing existing parking areas, it is assumed that the Upper Hearst Development would reduce the total number of parking spaces on-site from 407 to approximately 200, including 175 171 marked parking spaces and 25 attendant parking spaces. One driveway from La Loma-Hearst Avenue would provide vehicular access to the parking garage.

Page 66 in Draft SEIR Section 6, *Environmental Evaluation*, is revised as follows:

**Table 6:
Maximum Daily On-Site and Off-Site
Construction Air Pollutant Emissions**

	Emissions (lbs/day)			
	ROG	NO _x	Exhaust PM ₁₀	Exhaust PM _{2.5}
2019	2.3	22.7	1.3	1.2
2020	3.29	22.915	0.8	0.8
2021	2.87	21.0497	0.7	0.7
Maximum lbs/day¹	3.29	22.915	1.3	1.2
<i>BAAQMD Thresholds</i>	54	54	82	54
Threshold Exceeded?	No	No	No	No

¹ Maximum daily on and off-site emissions based on highest day in any construction year, i.e. 2019, 2020, or 2021.

Source: CalEEMod; see Appendix C for calculations.

Pages 102 to 104 in Draft SEIR Section 6, *Environmental Evaluation*, are revised as follows:

7. GREENHOUSE GAS EMISSIONS

SETTING

STATE GHG EMISSIONS INVENTORY

The California Air Resources Board (CARB) tracks greenhouse gas (GHG) emissions in the State in terms of carbon dioxide equivalent emissions (CO₂e). This metric describes the potential of various gases to contribute to global warming. Based on the CARB's California Greenhouse Gas Inventory for 2000-2016, California produced 429.4 million metric tons (MMT) of CO₂e in 2016, achieving its 2020 GHG emission reduction target as emissions fell below 431 MMT of CO₂e (CARB 2018a). The major source of greenhouse gas (GHG) emissions in California is associated with transportation, which contributes 41 percent of the state's total GHG emissions. The industrial sector is the second largest source, contributing 23 percent of the state's GHG emissions. Electric power accounts for approximately 16 percent of the total emissions.

UC BERKELEY GHG EMISSIONS INVENTORY

UC Berkeley's 1990 baseline emissions level is 160,389 metric tons (MT) of CO₂e (UC Berkeley 2019a). Every year, UC Berkeley completes an annual GHG emissions inventory to track its progress toward GHG emission reductions and reports these efforts publicly. The inventories are completed following reporting protocols developed by The Climate Registry, World Resources Institute, and CARB. UC Berkeley reports on ten emissions sources and in three different categories:

- Scope 1 - Direct Emissions: natural gas, campus fleet, emissions from refrigerants
- Scope 2 - Indirect Emissions: purchased electricity, energy purchased steam
- Scope 3 - Other Emissions: business air travel, student commute, faculty/staff commute, solid waste, water consumption

Table 7 shows the results of the annual GHG inventory from academic year 2009-2010 through academic year 2016-2017. In 2016-2017, the total annual GHG emissions from Scopes 1, 2 and 3 sources were 181,629 metric tons CO₂e; UC Berkeley's 2016-2017 emissions were approximately 5-9.4 percent lower than they were in 1990. UC Berkeley's 1990 baseline emissions level was 200,451 metric tons (MT) of CO₂e (UC Berkeley 2019a).

**Table 7:
UC Berkeley Annual GHG Emission Inventories**

<u>Year</u>	<u>Scope 1 Emissions (MT of CO₂e)</u>	<u>Scope 2 Emissions (MT of CO₂e)</u>	<u>Scope 3 Emissions (MT of CO₂e)</u>	<u>Total GHG Emissions (MT of CO₂e)</u>	<u>Service Population¹</u>	<u>Per SP Emissions (MT of CO₂e)</u>
<u>2009</u>	<u>144,059</u>	<u>9,048</u>	<u>40,524</u>	<u>193,631</u>	<u>48,414</u>	<u>4.00</u>
<u>2010</u>	<u>148,164</u>	<u>8,775</u>	<u>42,152</u>	<u>199,092</u>	<u>47,992</u>	<u>4.15</u>
<u>2011</u>	<u>150,709</u>	<u>6,479</u>	<u>33,573</u>	<u>190,761</u>	<u>48,257</u>	<u>3.95</u>
<u>2012</u>	<u>146,422</u>	<u>5,837</u>	<u>33,617</u>	<u>185,877</u>	<u>48,667</u>	<u>3.82</u>
<u>2013</u>	<u>123,961</u>	<u>6,582</u>	<u>34,999</u>	<u>165,543</u>	<u>49,277</u>	<u>3.36</u>
<u>2014</u>	<u>125,598</u>	<u>6,325</u>	<u>36,422</u>	<u>168,344</u>	<u>51,163</u>	<u>3.29</u>
<u>2015</u>	<u>141,079</u>	<u>6,191</u>	<u>44,087</u>	<u>191,357</u>	<u>52,117</u>	<u>3.67</u>
<u>2016</u>	<u>128,354</u>	<u>6,018</u>	<u>41,665</u>	<u>176,036</u>	<u>54,319</u>	<u>3.24</u>
<u>2017</u>	<u>135,076</u>	<u>4,262</u>	<u>42,290</u>	<u>181,629</u>	<u>57,637</u>	<u>3.15</u>

Note: Data was not available for academic year 2017-2018.

¹*Service population = students + faculty/staff*

Source: UC Berkeley 2016, 2019a, and 2019b; UCOP 2019

Academic Year	Scope 1 Emissions (MT of CO ₂ e)	Scope 2 Emissions (MT of CO ₂ e)	Scope 3 Emissions (MT of CO ₂ e)	Total GHG Emissions (MT of CO ₂ e)	Service Population ¹	Per SP Emissions (MT of CO ₂ e)
2009—2010	13,759	122,660	40,524	176,943	48,414	3.65
2010—2011	12,784	122,833	42,162	177,769	47,992	3.70
2011—2012	13,738	111,998	33,573	159,309	48,257	3.30
2012—2013	12,776	104,598	33,617	150,991	48,667	3.10
2013—2014	13,963	103,823	34,999	152,785	49,277	3.10
2014—2015	12,141	98,305	36,422	146,868	51,163	2.87
2015—2016	12,099	97,819	44,087	154,005	52,117	2.95
2016—2017	12,124	97,277	44,081	151,650	54,319	2.79

Note: Data was not available for academic year 2017-2018.

¹*Service population = students + faculty/staff*

Source: UC Berkeley 2016, 2019a, and 2019b; UCOP 2019

UC Berkeley has also completed projections of GHG emissions through academic year 2022-2023. As shown in Table 8, total annual GHG emissions during the 2018 to 2023 period are projected to ~~increase by approximately~~ remain generally flat without carbon mitigation initiatives. ~~41,000 MT of CO₂e per year above total annual GHG emissions reported in 2016~~ (Stoll 2019; UC Berkeley 2019a). ~~This substantial increase in emissions is due in large part to a major change in UC Berkeley's energy operations and electricity sourcing, which occurred in 2017.~~

UC Berkeley has been conducting annual greenhouse gas emissions inventories for over a decade. Through this inventory process the campus has tracked emissions and adjusted the accounting of inventories as required to report changing circumstances, adopt updated protocols and address new information and data. These adjustments to inventories have included changes to baseline inventories as well as future projections. As such, a recent operational change to ownership of the natural gas cogeneration plant to the campus triggered an inventory accounting adjustment.

~~Prior to 2017, UC Berkeley received heat for the main campus in the form of high-pressure steam from the on-campus cogeneration plant, which was owned and operated by a third party, and purchased electricity from PG&E to power its main campus, which constitutes 97 percent of UC Berkeley's electricity consumption. Between the opening of the plant in the 1980s and mid-2017, the third-party owner and operator had a power purchase agreement with PG&E to sell electricity generated by the cogeneration plant to PG&E and steam to the campus. The Scope 1 GHG emissions associated with the plant during those years were the responsibility of the third-party owner operator. In 2017, the third-party operator's power purchase agreement with PG&E ended as did UC Berkeley's energy services contract with the third-party operator. Following the end of both contracts, UC Berkeley assumed ownership of the cogeneration plant and began to use the majority of its main campus electricity from the cogeneration plant.~~

As a result of the shift in electricity source from PG&E to the cogeneration plant, the GHG emissions from electricity consumed by UC Berkeley nearly doubled because electricity produced by the cogeneration plant is produced exclusively from natural gas combustion whereas electricity produced by PG&E is partially produced by a mix of carbon-free sources including renewables, nuclear, and hydropower (UC Berkeley 2016). This change in ownership did not result in more GHG emissions overall as the plant existed on campus in 1990. The change in ownership shifted the reporting entity for GHG emissions associated with the plant from the third party to UC Berkeley. As such a recalculation of UC Berkeley's baseline 1990 emission levels would be appropriate according to public sector protocols outlined by the World Resources Institute (WRI 2010).

**Table 8:
Projected UC Berkeley GHG Emissions**

Year	Scope 1 Emissions (MT of CO₂e)	Scope 2 Emissions (MT of CO₂e)	Scope 3 Emissions (MT of CO₂e)	Total GHG Emissions (MT of CO₂e)	Service Population¹	Per SP Emissions (MT of CO₂e)
2018	134,634	4,580	42,606	181,819	58,763	3.09
2019	134,304	4,295	42,894	181,492	59,776	3.04
2020	134,075	4,069	43,187	181,331	60,559	2.99
2021	133,938	4,090	43,495	181,523	61,357	2.96
2022	133,884	4,111	43,805	181,800	62,090	2.93

¹ Year = GHG emissions inventories are based on calendar year

² Service population = students + faculty/staff

Source: Stoll 2019

Academic Year	Scope 1 Emissions (MT of CO₂e)	Scope 2 Emissions (MT of CO₂e)	Scope 3 Emissions (MT of CO₂e)	Total GHG Emissions (MT of CO₂e)	Service Population¹	Per SP Emissions (MT of CO₂e)
2018—2019	144,961	4,556	42,894	192,410	58,763	3.27
2019—2020	144,975	4,275	43,187	192,437	59,776	3.22
2020—2021	144,989	4,274	43,495	192,757	60,559	3.18
2021—2022	145,003	4,272	43,805	193,080	61,357	3.15
2022—2023	145,017	4,270	44,117	193,404	62,090	3.11

¹ Service population = students + faculty/staff

Source: Stoll 2019

As indicated by Tables 7 and 8, the shift in sourcing of electricity between 2016 and 2018 has substantially increased UC Berkeley's reported direct Scope 1 emissions from the campus (e.g., the cogeneration plant, which is now owned and operated by UC Berkeley instead of a third party operator), while decreasing Scope 2 emissions (e.g., purchased electricity and steam). Figure 25 shows UC Berkeley's historic and projected annual GHG emissions by scope.

Annual emissions in ~~2016-2017~~ were approximately ~~151,650~~~~181,629~~ MT of CO₂e per year, or ~~2.83~~~~1.15~~ MT of CO₂e per service population per year (UC Berkeley 2019a).² However, as discussed above, the shift in the main campus electricity source from PG&E to the on-campus cogeneration plant in 2017 is projected to increase UC Berkeley's reported total annual emissions by approximately 41,000 MT of CO₂e per year from 2016 to 2018. As a result, total reported annual GHG emissions are anticipated to increase to approximately 192,000 MT of CO₂e per year, or 3.3 MT of CO₂e per service population per year, for academic year ~~2018-2019~~. As campus headcount continues to increase, however, per service population GHG emissions from ~~academic years 2018-2019~~ through 2022-2023 are projected to decline from approximately ~~3.273~~~~0.9~~ MT of CO₂e per service population per year to ~~3.142~~~~0.93~~ MT of CO₂e per service population per year.

Page 110 in Draft SEIR Section 6, *Environmental Evaluation*, is revised as follows:

UC Berkeley and the UC system prioritize on-site reductions in GHG emissions reductions through energy efficiency, including plans for a two percent annual energy intensity per square foot reduction. UC Berkeley and the UC system also prioritize on-site renewable generation and new renewable and carbon-free generation in offsite power procurement. Furthermore, UC Berkeley is regulated under State Cap & Trade and complies with the intent of the regulation, to reduce the carbon-intensity of energy use and greenhouse gas emissions over-time. Because UC Berkeley's energy demand, even after all cost-effective efficiency investments are made, will likely exceed the amount of renewable and carbon-free energy available by 2025, the campus plans to procure green power from off-campus for eligible accounts and appropriate carbon offsets until such time that on-site emissions reductions achieve carbon neutrality.

Page 114 in Draft SEIR Section 6, *Environmental Evaluation*, is revised as follows:

Consistent with the 2020 LRDP and 2020 LRDP EIR, the new buildings would be designed to achieve a minimum LEED Silver rating and would target a Gold rating for new construction. According to the LEED checklists prepared for the Upper Hearst Development, potable water used in outdoor landscaping would be reduced by 50 to 100 percent from baseline building performance, while indoor water use would be reduced by a minimum of 20 percent from baseline building performance. Landscaping would minimize water demand by the use of native, drought-tolerant plants. Reduced water demand would result in fewer emissions from electricity used to supply water. The Upper Hearst Development also would be subject to the UC Policy on Sustainable Practices green building requirement to outperform California Title 24 energy efficiency standards by a minimum of 20 percent or achieve whole-building energy performance targets shown in Table 1 of Section V.A.3 of the policy, which would incrementally reduce emissions from generating and transporting energy. The Project itself is designed to use no natural gas and be outfitted with an all-electric energy system. Purchased electricity supplied to the Project would be 100 percent carbon-free by 2025 if not sooner. Exterior lighting would be on photocell control, switching on and off depending on the amount of daylight present. Interior lighting would have occupancy sensors to turn off lights when people are not present and would meet LEED quality criteria.

Pages 111 and 112 in Draft SEIR Section 6, *Environmental Evaluation*, are revised as follows:

UC Berkeley Carbon Neutrality Framework

In 2016, UC Berkeley published the 2025 Carbon Neutrality Framework, which discusses strategies for achieving the University of California’s GHG reduction goals of net-zero Scope 1 and 2 emissions by 2025 and net-zero Scope 3 emissions by 2050. ~~The 2025 goal translates to a total emissions reduction of approximately 80 percent below 2016 levels.~~ The 2025 Carbon Neutrality Framework acknowledges the challenge of achieving carbon neutrality given the change in electricity supply source from PG&E, ~~which partially sources electricity from carbon-free sources, to in ownership of the on-campus cogeneration plant, which relies solely on natural gas combustion.~~ As discussed in the framework, 90 percent of the campus’ Scope 1 and 2 emissions are associated with the on-campus cogeneration plant; therefore, reducing GHG emissions from the cogeneration plant and building energy usage is the main focus for achieving carbon neutrality.

Page 115 to 118 in Draft SEIR Section 6, *Environmental Evaluation*, are revised as follows:

CONSISTENCY WITH AB 32

AB 32 requires that California reduce its statewide GHG emissions to 1990 levels by 2020. To contribute to statewide attainment of this target, the UC Sustainable Practices Policy requires that each campus reduce GHG emissions to 1990 levels by 2020. The ~~2016~~ 2017 GHG inventory total is approximately ~~59.4~~ percent below UC Berkeley’s 1990 GHG emissions level. ~~However, as~~ As discussed in the Setting, ~~due to the shift in the main campus’ electricity source from PG&E to the on-site cogeneration plant in 2017,~~ UC Berkeley’s annual GHG emissions from implementation of the 2020 LRDP are not projected to exceed 1990 levels from academic year 2018-2019 through academic year 2022-2023. ~~Nonetheless,~~ As discussed in the Setting, in accordance with the World Resources Institute’s U.S. Public Sector Protocol, the 1990 baseline emissions and subsequent years have been ~~may need to be~~ recalculated because of the ~~substantial~~ structural change related to the reassignment of control of the on-site cogeneration plant to UC Berkeley. ~~Nonetheless, continued implementation of the 2020 LRDP would not be consistent with the UC’s goal of reducing emissions to 1990 levels by 2020 in compliance with AB 32, without further measures to reduce emissions.~~ Because construction and operation of the Upper Hearst Development would be part of implementation of the 2020 LRDP, new GHG emissions from construction and operation of the Project would contribute to some increased emissions, however, this Project would not cause ~~the projected~~ campus-wide exceedance of the UC’s adopted target of reducing GHG emissions to 1990 levels by 2020 and to comply with AB 32.

CONSISTENCY WITH UC POLICY

The UC Carbon Neutrality Initiative and Sustainable Practices Policy require that UC Berkeley reaches “climate neutrality” in Scope 1 and 2 emissions by 2025. This means achieving net zero emissions campus-wide from Scope 1 and 2 sources. As shown in Table 8, UC Berkeley’s Scope 1 and 2 emissions in the 2018-2019 academic year are projected to total approximately ~~149,517~~ 139,214 MT of CO₂e. ~~(144,961 MT + 4,556 MT).~~ Because construction and operation of the Upper Hearst Development would generate direct emissions from the use of natural gas and ~~electricity, and steam,~~ it would

increase existing campus-wide emissions. Therefore, in order for the 2020 LRDP and the Upper Hearst Development to be consistent with UC policy to achieve carbon neutrality in Scope 1 and 2 emissions by 2025, implementation of Mitigation Measure GHG-1 would be required to offset the UC Berkeley's increased GHG emissions.

CONSISTENCY WITH SB 32

It is anticipated that the Upper Hearst Development would be fully operational in 2022-2023. The Association of Environmental Professionals White Paper, Beyond 2020 and Newhall, presents substantial evidence that GHG significance thresholds should be based on the State-adopted target for the next milestone (i.e., 2020, 2030, or 2050) for which the State has completed adequate GHG reduction planning. Specifically, identified targets should be for a milestone that follows a project's operational year. SB 32 sets a statewide GHG reduction target of 40 percent below 1990 levels by the year 2030, and would therefore be subject to the 2030 GHG reduction target established by SB 32. To contribute to the State's attainment of this target, UC Berkeley would have to reduce total annual GHG emissions 40 percent below 1990 levels by the year 2030, to approximately ~~96,233~~120,271 MT of CO₂e.

Beginning in 2018, total GHG emissions from UC Berkeley are projected to ~~increase~~ decrease very slightly from ~~192,410~~181,819 MT of CO₂e per year in academic year 2018-2019 to ~~193,404~~181,800 MT of CO₂e per year in academic year 2022-2023. ~~As a result,~~ UC Berkeley's GHG emissions trajectory is likely not on track toward attaining the 2030 GHG reduction target established by SB 32 and would be inconsistent with this target. Because GHG emissions from construction and operation of the Upper Hearst Development would contribute to this potential exceedance of applicable GHG reduction targets, the Project would also be inconsistent with SB 32 without mitigation.

As discussed above, implementation of Mitigation Measure GHG-1 would be required to achieve campus-wide net zero Scope 1 and Scope 2 emissions by 2025, consistent with the adopted UC Carbon Neutrality Initiative and Sustainable Practices Policy. This carbon neutrality policy is a more stringent target than SB 32 because it requires net zero Scope 1 and 2 emissions, which comprise approximately 78 percent of UC Berkeley's annual GHG emissions.² By achieving carbon neutrality of Scope 1 and 2 emissions, UC Berkeley would reduce total annual GHG emissions to approximately ~~44,748~~25 MT of CO₂e by 2025, which would be well below the 40 percent GHG emission reductions necessary to achieve the SB 32 target for 2030.³ As a result, consistency with the UC Carbon Neutrality Initiative and Sustainable Practices Policy would also result in consistency with the GHG reduction target established by SB 32.

² As shown in Table 8, for academic year 2018-2019, UC Berkeley's Scope 1 and 2 emissions are projected to total approximately ~~149,517~~139,214 MT of CO₂e per year (~~134,634~~144,961 MT + ~~4,580~~4,556 MT). Therefore, Scope 1 and 2 emissions comprise approximately ~~76.7~~77 percent of total annual GHG emissions (~~139,214~~139,214 MT / ~~181,819~~181,819 MT * 100%)

³ Scope 3 emissions in academic year 2024-2025 were estimated using a linear trendline of projected Scope 3 emissions from academic year 2018-2019 through academic year 2022-2023.

CONSISTENCY WITH 2017 CLIMATE CHANGE SCOPING PLAN

California's 2017 Climate Change Scoping Plan also includes goals to reduce climate impacts. Table 9 evaluates the Upper Hearst Development's consistency with applicable goals. As shown by Table 9, the Upper Hearst Development would be consistent with applicable goals in California's 2017 Climate Change Scoping Plan to reduce climate impacts.

**Table 9:
Consistency with 2017 Climate Change Scoping Plan**

Goals	Implemented by Project?
Transportation	
Increase the number, safety, connectivity, and attractiveness of biking and walking facilities to increase use.	<i>Yes. The Upper Hearst Development would facilitate active transportation by adding an estimated 52 bicycle parking spaces on-site.</i>
Promote transportation fuel system infrastructure for electric, fuel-cell, and other emerging clean technologies that is accessible to the public where possible, and especially in underserved communities, including environmental justice communities.	<i>Yes. The new or renovated Upper Hearst parking structure would include an estimated 10 parking spaces for electric vehicles.</i>
Quadruple the proportion of trips taken by foot by 2030 (from a baseline of the 2010–2012 California Household Travel Survey).	<i>Yes. The proposed residential building would provide housing adjacent to the GSPP complex and the Campus Park, incentivizing pedestrian trips for academic purposes.</i>
Water	
Make conservation a California way of life by using and reusing water more efficiently through greater water conservation, drought tolerant landscaping, stormwater capture, water recycling, and reuse to help meet future water demands and adapt to climate change.	<i>Yes. Landscaping would minimize water demand by the use of native, drought-tolerant plants. Irrigation of landscaping would include the use of drip systems. Watering of landscaping would be reduced 50 to 100 percent from baseline building performance. Indoor water use also would be reduced by 20 percent to attain LEED certification. Stormwater runoff would be better controlled due to the conversion of the northern portion of the site from an existing surface parking lot. Stormwater runoff from the buildings and paved areas would be discharged into and filtered through stepped stormwater planters prior to discharge to the City storm drain system</i>
Energy	
Reduce fossil fuel use.	<i>Yes. The Upper Hearst Development would reduce the number of parking spaces on-site, incentivizing active transportation and transit use rather than the use of motor vehicles. Vehicle trips would still decrease relative to the 2001-2002 school year. The Project site also is accessible from a number of transit lines that run along Hearst Avenue, which borders the site.</i>

**Table 9:
Consistency with 2017 Climate Change Scoping Plan**

Goals	Implemented by Project?
Reduce energy demand.	<i>Yes. The Upper Hearst Development would use no natural gas and be outfitted with an all-electric energy system. Purchased electricity supplied to the Project would be 100 percent carbon-free by 2025 if not sooner. It would employ energy efficiency strategies in all building disciplines in order to achieve a 20 percent energy use reduction below Title 24 requirements. Exterior lighting would be on photocell control, switching on and off depending on the amount of daylight present. Interior lighting would have occupancy sensors to turn off lights when people are not present and would meet LEED quality criteria. Exterior windows would enable the use of daylight as an integral part of lighting systems, with shading provided to control illumination levels. In addition, all roofing materials would have a high solar reflective index to reduce the heat island effect.</i>
Waste	
Maximize recycling and diversion from landfills.	<i>Yes. The campus has an existing policy to increase diversion of construction and demolition waste. All trash rooms in the Upper Hearst Development would accommodate recycling and composting containers.</i>

CONSISTENCY WITH EXECUTIVE ORDER B-55-18 (CARBON NEUTRALITY)

With implementation of Mitigation Measure GHG-1, UC Berkeley would achieve carbon neutrality in Scope 1 and 2 emissions by 2025. Therefore, with mitigation incorporated, UC Berkeley would contribute its fair share toward the statewide 2045 carbon neutrality goal established by EO B-55-18 and would not conflict with this goal.

MM-GHG-1 By May 1, 2021, if necessary, UC Berkeley shall purchase sufficient carbon offsets and/or renewable energy certificates within the State of California to reduce annual campus-wide greenhouse gas emissions to 1990 baseline levels. With such reductions in GHG emissions, UC Berkeley shall meet the GHG reduction target in the UC Sustainable Practices Policy for the year 2020, which would ensure consistency with the statewide target established by AB 32. If necessary, by May 1, 2026, UC Berkeley shall purchase carbon offsets and/or renewable energy certificates to achieve campus-wide carbon neutrality in Scope 1 and 2 emissions by 2025, consistent with the UC Sustainable Practices Policy.

Implementation of Mitigation Measure GHG-1 would ensure that UC Berkeley's net GHG emissions, after purchase of carbon offsets and/or renewable energy certificates, would be consistent with the UC's 2025 carbon neutrality target. As discussed above, by achieving carbon neutrality in Scope 1 and 2 emissions by 2025, UC Berkeley would also meet the State's SB 32 emissions reduction target for 2030 and would contribute its fair share toward the statewide 2045 carbon neutrality goal. Therefore, the impact on global climate change would be less than significant after mitigation.

Page 118 to 119 in Draft SEIR Section 6, *Environmental Evaluation*, are revised as follows:

SUMMARY OF GREENHOUSE GAS EMISSIONS ANALYSIS

The Upper Hearst Development would be within the development parameters of the 2020 LRDP and would not generate additional GHG emissions above those anticipated in the 2020 LRDP EIR Addendum #5. Furthermore, the Upper Hearst Development would be planned, designed, and managed to comply with the UC Sustainable Practices Policy and would incorporate best practices and specific design elements to reduce GHG emissions. Total annual GHG emissions from UC Berkeley are projected to slightly increase in academic year 2018-2019 and continue increasing ~~decrease slightly through by academic year 2022-2023, resulting from the change in ownership of the campus cogeneration plant. Therefore~~ As required, UC Berkeley would implement Mitigation Measure GHG-1. Under this mitigation measure, if UC Berkeley is unable to bring/maintain emissions to 1990 levels in 2020 (consistent with AB 32's reduction target) or to achieve carbon neutrality of scope 1 and 2 emissions in 2025 (consistent with the Carbon Neutrality Initiative), it would purchase carbon offsets and/or renewable energy certificates sufficient to reduce GHG impacts to a less than significant level, consistent with the 2020 LRDP EIR Addendum #5's determination of GHG impacts. In addition, the Project would implement the policies described in the 2020 LRDP EIR, as amended. The Project would also be consistent with the strategies and goals of the 2025 Carbon Neutrality Framework and the 2017 Climate Change Scoping Plan and, therefore, would not conflict with any applicable plan adopted for the purpose of reducing the emissions of GHGs.

Page 168 in Draft SEIR Section 6, *Environmental Evaluation*, is revised as follows:

The 2020 LRDP EIR determined that implementation of the 2020 LRDP would increase vehicle trips and traffic congestion at signalized intersections, leading to a significant and unavoidable impact on traffic flow because no mitigation measures would be feasible (2020 LRDP EIR Vol 1, p. 4.12-53). However, the trip generation analysis provided above estimates that the Upper Hearst Development would reduce existing AM peak-hour traffic by 4145 vehicle trips and PM peak-hour traffic by 1345 vehicle trips. Therefore, it would not considerably contribute to the 2020 LRDP program's significant and unavoidable impact on traffic flow.

In addition to average daily traffic associated with the Upper Hearst Development, UC Berkeley anticipates up to 40 events per year at the proposed academic building that would also generate vehicle trips near the Project site. Many events at the academic building would occur during midday or evening hours and would not generate substantial vehicle trips during peak-hour traffic. GSPP is also primarily a graduate school and many events are geared towards students and faculty. UC Berkeley's most recent Transportation Survey from 2016 indicates that attendees would typically walk or bicycle to events. The walking mode share is 25 percent for graduate students, 63 percent for undergraduates, and 11 percent for faculty. In addition, the bicycle mode share is 24 percent for graduate students, 9 percent for undergraduates, and 18 percent for faculty. Therefore, a substantial proportion of attendees would walk or bike to and from the academic building, reducing the increase in trips and parking demand during occasional events. Considering these factors and the expected decrease in average daily traffic near the Project site, the ~~The~~ Upper Hearst Development would have a less than

significant impact on the performance of the circulation system. Nonetheless, Mitigation Measure T-1 would be required to manage vehicle trips generated by special events at the academic building. In addition, Mitigation Measure T-2 would be required to minimize potential blockage of the proposed driveway during peak-hour traffic on La Loma Avenue. These mitigation measures would further reduce the Upper Hearst Development's already less-than-significant traffic impact.

MM-T-1 Prior to occupancy of the Upper Hearst Development, UC Berkeley shall prepare and approve a transportation management plan for special events at the proposed academic building that are expected to have at least 200 external attendees. Once the Upper Hearst Development is in operation, UC Berkeley shall implement the plan, which shall include a menu of options for UC Berkeley to implement to minimize the effect of special events on traffic congestion near the Project site, which may include but are not limited to:

- Scheduling events during non-peak times (evenings and weekends), to the extent feasible
- Informing event attendees of appropriate parking and pick-up/drop-off locations
- Considering the posting of flagpersons to manage pick-up and drop-off activity on Hearst Avenue and/or vehicles entering and exiting the Upper Hearst parking structure
- Considering monitoring of traffic conditions during special events and modifying the transportation management plan as appropriate

MM-T-2 To minimize blockage of the driveway to the Upper Hearst parking structure on La Loma Avenue, UC Berkeley shall coordinate with the City of Berkeley to provide "KEEP CLEAR" pavement markings on southbound La Loma Avenue adjacent to the driveway.

Implementation of Mitigation Measure T-1 to manage vehicle trips associated with special events would further reduce the Upper Hearst Development's already less-than-significant traffic impact. Implementation of Mitigation Measure T-2 would substantially reduce blockage of the proposed driveway during peak-hour traffic conditions on La Loma Avenue.

Pages 169 and 170 in Draft SEIR Section 6, *Environmental Evaluation*, are revised as follows:

The Upper Hearst Development would involve reconfiguring access to the rebuilt parking structure on the Project site. Whereas the existing parking structure has three driveways, from Hearst and La Loma avenues and Ridge Road, the new parking structure would have a single driveway from ~~Hearst~~ La Loma Avenue. Based on ~~preliminary~~ site plans for the parking structure, the new ~~Hearst~~ La Loma Avenue driveway ~~may not~~ would provide adequate sight distance between vehicles exiting the driveway and pedestrians on the adjacent sidewalk (Appendix F). Adequate sight distance is defined as a clear line-of-sight between a motorist 10 feet back from the

sidewalk and a pedestrian 10 feet away on each side of the driveway. Therefore, the Upper Hearst Development would have a less than significant impact on traffic safety.~~The potential lack of adequate sight distance would introduce a traffic hazard due to a design feature. Implementation of Mitigation Measure T 1 would be required to ensure adequate sight distance.~~

~~**MM T 1** The driveway to the rebuilt Upper Hearst parking structure on Hearst Avenue shall be designed to provide adequate sight distance between vehicles existing the parking garage and pedestrians on the adjacent crosswalk. Adequate sight distance is defined as a clear line of sight between a motorist 10 feet back from the sidewalk and a pedestrian 10 feet away on each side of the driveway. If the driveway cannot be sited to provide adequate sight distance, UC Berkeley shall install mirrors on both sides of the driveway to aid drivers' and pedestrians' visibility. In addition, UC Berkeley shall install flashing lights to alert pedestrians when a vehicle is exiting the driveway.~~

~~With implementation of Mitigation Measure T 1, adequate sight distance would be provided at the driveway to the Upper Hearst parking structure. The Upper Hearst Development would not involve other significant changes in the road or path system, nor would it introduce any new types of vehicles that could create new design hazards. Therefore, the Upper Hearst Development's impact related to design hazards would be within the scope of the 2020 LRDP EIR's analysis and less than significant. The increase in UC Berkeley's existing and projected headcount would not require additional physical changes beyond those anticipated in the 2020 LRDP in the road or path system or introduce new roadway hazards. This impact would be less than significant.~~

Page 173 in Draft SEIR Section 6, *Environmental Evaluation*, is corrected as follows:

The Project site would be served from EBMUD's Santa Barbara Regulated Pressure Zone and the Summit Pressure Zone (Maggiore 2018).

Page 190 in the Draft SEIR is revised in the Final SEIR as follows:

**Table 21:
Comparison of Features of Proposed Project and Alternatives**

Feature	Proposed Project	Alternative			
		No Project	Off-site Lease Agreement	Academic Building Only	Reduced Scale
Parking supply on-site	171 200 spaces	407 spaces	407 spaces	407 spaces	≤ 171 200 spaces
Demolition	1) Upper Hearst parking structure 2) Ridge Lot	None	None	1) Ridge Lot	1) Upper Hearst parking structure 2) Ridge Lot
New structures					
Academic building	37,000 sf	None	None	37,000 sf	25,000 sf
Residential building	Up to 150 units	None	None	None	Up to 150 units
Parking garage	New Upper Hearst parking structure	None	None	None	New Upper Hearst parking structure
Maximum building height	Up to six stories	N/A	N/A	Two stories	Four stories

Source: UC Berkeley, January 2019

Pages 9 and 10 of the Upper Hearst Development – Transportation Assessment in Appendix F to the Draft SEIR are revised as follows:

A queuing analysis was completed for the Gayley Road/La Loma Avenue/Hearst Avenue intersection and the adjacent garage driveway to assess the impact of the Proposed Project driveway on queuing. Queues were analyzed by modeling traffic operations at the Gayley Road/La Loma Avenue/Hearst Avenue intersection and the project driveway on La LomaHearst Avenue using Synchro 10 software to estimate the 50th and 95th percentile queues during the AM and PM peak hours. Driveway volumes were estimated by applying the existing average trip generation rate per space (summarized in the trip generation section above) to the proposed number of spaces under the Proposed Project and all trips were assigned to the single driveway. Queue reports are provided in Appendix DE.

The Proposed Project would provide one driveway on La LomaHearst Avenue approximately 100 feet north200 feet west of the Gayley Road/La Loma Avenue/Hearst Avenue intersection. Table 4 summarizes the 50th and 95th percentile queue lengths. Southbound 95th percentile queues at the Gayley Road/La Loma Avenue/Hearst Avenue intersection would result in a small queue spillback that blocks the upstream La Loma Avenue driveway during the AM and PM peak hours; however, these queues would generally clear within each signal cycle at the intersection and would be similar to current conditions. Peak hour queues would not spill back to the driveway during most

of the peak hour and the spillback would only occur for a short period of time; therefore, the project driveway would not cause a significant queuing conflict. ~~Vehicles queues are not expected to result in queue spillbacks and block upstream intersections or driveways during the AM and PM peak hours. Therefore, the project driveway would not cause a significant queuing conflict.~~

Although the queue spillback on southbound La Loma Avenue is not considered a significant impact, the following recommendation is provided to minimize blockage of the garage driveway.

Recommendation 1: Provide “KEEP CLEAR” pavement markings on southbound La Loma Avenue at the garage driveway to minimize blockage of the driveway.

Table 4 – Project Queuing Summary

Movement	Storage Length ¹	50 th Percentile Queue Length ²		95 th Percentile Queue Length ²	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Gayley Road/La Loma Avenue/Hearst Avenue					
Southbound Eastbound	<u>100</u> 200 feet	<u>80 feet</u>	<u>60 feet</u>	<u>120</u> 440 feet	<u>100</u> 50 feet
La Loma Avenue Driveway					
Northbound Eastbound	<u>100</u> 240 feet	<u><20 feet</u>	<u><20 feet</u>	<20 feet	<20 feet
Southbound Westbound	<u>170</u> 200 feet	<u><20 feet</u>	<u><20 feet</u>	<20 feet	<20 feet

Bold indicated that 95th percentile queue would exceed the available storage.

1. Storage length is defined as the length in feet between the study intersection and the nearest adjacent intersection.

2. 50th and 95th percentile queues based on the Synchro 10 software.

Source: Fehr & Peers, 2019.

~~Based on our review of the preliminary site plan for the Proposed Project, the Hearst Avenue driveway may not provide adequate sight distance between vehicles exiting the driveway and pedestrians on the adjacent sidewalk. Adequate sight distance is defined as a clear line of sight between a motorist ten feet back from the sidewalk and a pedestrian ten feet away on each side of the driveway.~~

~~Recommendation 1: For the Proposed Project, ensure that the garage driveway on Hearst Avenue would provide adequate sight distance between vehicles exiting the parking garage and pedestrians on the adjacent crosswalk. If adequate sight distance cannot be provided, install mirrors on both sides of the driveway to aid drivers' and pedestrians' visibility and install flashing lights to alert pedestrians when a vehicle is exiting the driveway.~~

5. MITIGATION MONITORING AND REPORTING PROGRAM

University of California

Mitigation Monitoring Program (CEQA)

Physical and Environmental Planning

Report on CEQA Mitigation Measures and Compliance Question by Project, Phase, Responsible Department(s), EIR(s)

Project Extracted: Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan

Project Phase(s): Planning and Schematic Design (P), CDs and Bid (W), Construction (C), Post-Occupancy (O)

Responsible Department(s):

BAS: UCB Business & Administrative Services

CFM: Campus Fire Marshal

EH&S: UCB Environment Health and Safety

RSSP: UCB Residential & Student Services Program

P&T: UCB Parking & Transportation

PEP: UCB Physical & Environmental Planning

PM: UCB Project Management

PP-CS: UCB Physical Plant—Campus Services

UCPD: UCB Police Department

OEP: UCB Office of Emergency Preparedness

EIR(s) Searched: Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan SEIR, 2020 LRDP EIR, Addendum #5 to Address Climate Change

NOTES:

Prepared by:

Raphael Breines [rbreines@berkeley.edu]

Physical & Environmental Planning

University of California, Berkeley

300 A&E Building, Berkeley, CA 94720-1382

Project Name: Upper Hearst Development

Dept: PEP

Phase:

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
Aesthetics			
2020 LRDP CBP AES-1-b. Major new campus projects would continue to be reviewed at each stage of design by the UC Berkeley Design Review Committee. The provisions of the 2020 LRDP, as well as project specific design guidelines prepared for each such project, would guide these reviews.	a) Has this project been reviewed at each stage of design by DRC? b) Have project-specific design guidelines and LRDP provisions guided the DRC review?	PEP, PM	P
2020 LRDP CBP AES-1-e. UC Berkeley would make informational presentations of all major projects in the City Environs in Berkeley to the Berkeley Planning Commission and, if relevant, the Berkeley Landmarks Commission for comment prior to schematic design review by the UC Berkeley Design Review Committee. Major projects in the City Environs in Oakland would similarly be presented to the Oakland Planning Commission and, if relevant, to the Oakland Landmarks Preservation Advisory Board.	a) Was this project presented for comment, prior to DRC review, to the City of Berkeley or Oakland Planning Commissions and, if relevant, to the Landmarks Preservation Commission/Advisory Board? b) For a project in the City Environs, has a staff representative designated by the city in which the project is located been invited to attend the UC Berkeley DRC to comment on the project?	PEP	P
2020 LRDP CBP AES-1-f. Each individual project built in the City Environs under the 2020 LRDP would be assessed to determine whether it could pose potential significant aesthetic impacts not anticipated in the 2020 LRDP, and if so, the project would be subject to further evaluation under CEQA.	a) Has the project been assessed to determine whether it could pose potential significant aesthetic impacts not anticipated in the 2020 LRDP? b) If (an) unanticipated impact(s) may occur, has further CEQA evaluation been performed? Briefly describe nature of evaluation in Comment column.	PEP	P
2020 LRDP CBP AES-1-g. To the extent feasible, University housing projects in the 2020 LRDP Housing Zone would not have a greater number of stories nor have setback dimensions less than could be permitted for a project under the relevant city zoning ordinance as of July 2003.	a) Does this project have a greater number of stories than could be permitted for a project under the relevant city zoning ordinance as of July 2003? b) Does this project have setback dimensions less than could be permitted for a project under the relevant city zoning ordinance as of July 2003?	PEP	P
2020 LRDP EIR MM AES-3-a. Lighting for new development projects would be designed to include shields and cut-offs that minimize light spillage onto unintended surfaces and minimize atmospheric light pollution. The only exception to this principle would be in those areas where such features would be incompatible with the visual and/or historic character of the area.	Does project lighting include shields and cut-offs to minimize spill-over and light pollution (unless such features are incompatible with visual or historic character of the project or its immediate context)?	PM	P
2020 LRDP EIR MM AES-3-b. As part of the design review procedures described in the above Continuing Best Practices, light and glare would be given specific consideration, and measures incorporated into	a) Have light and glare been given special consideration during design? b) Have design measures been incorporated into the	PM	P

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
the project design to minimize both. In general, exterior surfaces would not be reflective: architectural screens and shading devices are preferable to reflective glass.	project to minimize light pollution and glare? c) Are exterior surfaces reflective? d) Have architectural screening and shading been incorporated into project design?		
2020 LRDP CBP BIO-1-a. UC Berkeley will continue to implement the Campus Specimen Tree Program to reduce adverse effects to specimen trees and flora. Replacement landscaping will be provided where specimen resources are adversely affected, either through salvage and relocation of existing trees and shrubs or through new plantings of the same genetic strain, as directed by the Campus Landscape Architect.	a) Has the Campus Specimen Tree Program been implemented to reduce adverse impacts to specimen trees and flora? b) Has replacement landscaping as directed by the CLA been provided where specimen resources are adversely affected?	PM, OEP	P and W
Air Quality			
2020 LRDP EIR CBP AIR-4-a. UC Berkeley shall continue to include in all construction contracts the measures specified below to reduce fugitive dust impacts: <ul style="list-style-type: none"> All disturbed areas, including quarry product piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using tarps, water, (non-toxic) chemical stabilizer/suppressant, or vegetative ground cover. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or (non-toxic) chemical stabilizer/suppressant. When quarry product or trash materials are transported off-site, all material shall be covered, or at least two feet of freeboard space from the top of the container shall be maintained. 	a) Are measures to reduce fugitive dust impacts included in construction contracts? b) Have all disturbed areas not under active construction been stabilized for dust emissions using tarps, water, (non-toxic) chemical stabilizer/suppressant, or vegetative ground cover? c) Have all on-site unpaved roads, and unpaved access roads to the site, been stabilized for dust emissions using water or non-toxic chemical stabilizer/suppressant? d) When quarry product or trash materials are transported off-site, are all materials covered, or has at least two feet of freeboard space from the top of the container/truck been maintained?	PM, OEP	W and C
2020 LRDP EIR MM AIR-4-a. In addition, UC Berkeley shall include in all construction contracts the measures specified below to reduce fugitive dust impacts, including but not limited to the following: <ul style="list-style-type: none"> All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking. When demolishing buildings, water shall be applied to all exterior surfaces of the building for dust suppression. All operations shall limit or expeditiously remove the accumulation of mud or dirt from paved areas of 	a) Are measures to reduce fugitive dust impacts included in construction contracts? b) Have all dust emissions been stabilized and controlled using presoaking or water applications during work, including applications to building surfaces during demolition? c) Have all operations limited or expeditiously removed the accumulation of mud or dirt from paved areas of construction sites and from adjacent public streets as necessary? d-i) Immediately after adding or removing materials from any storage pile, has water or coverings been used to control dust emissions from the pile?	PM, OEP	W and C

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
<p>construction sites and from adjacent public streets as necessary. See also CBP HYD 1-b.</p> <ul style="list-style-type: none"> Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions by utilizing sufficient water or by covering. Limit traffic speeds on unpaved roads to 15 mph. Water blasting shall be used in lieu of dry sand blasting wherever feasible. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with slopes over one percent. To the extent feasible, limit area subject to excavation, grading, and other construction activity at any one time. Replant vegetation in disturbed areas as quickly as possible. 	<p>d-ii) Has water blasting been used in lieu of dry sand blasting wherever feasible?</p> <p>e) Has excavation, grading and other construction been limited to the smallest possible area, insofar as feasible?</p> <p>f) Have erosion control measures been utilized, and disturbed areas been revegetated as quickly as possible, to prevent silt runoff?</p>		
<p>2020 LRDP EIR CBP AIR-4-b. UC Berkeley shall continue to implement the following control measure to reduce emissions of diesel particulate matter and ozone precursors from construction equipment exhaust:</p> <ul style="list-style-type: none"> Minimize idling time when construction equipment is not in use. 	When construction equipment is not in active use, has idling time been minimized?	PM, OEP	W and C
<p>2020 LRDP EIR MM AIR-4-b. UC Berkeley shall implement the following control measures to reduce emissions of diesel particulate matter and ozone precursors from construction equipment exhaust:</p> <ul style="list-style-type: none"> To the extent that equipment is available and cost effective, UC Berkeley shall require contractors to use alternatives to diesel fuel, retrofit existing engines in construction equipment and employ diesel particulate matter exhaust filtration devices. To the extent practicable, manage operation of heavy-duty equipment to reduce emissions, including the use of particulate traps. 	<p>a) Have contractors, including subs, been required to use alternate fuels and retrofit existing construction equipment engines accordingly, to the extent that such equipment and fuel is available and cost-effective?</p> <p>b) Has the project managed operation of heavy-duty equipment to reduce emissions, including the use of particulate traps, to the extent practicable?</p>	PM, OEP	W and C
2020 LRDP EIR CBP AIR-5. UC Berkeley will continue to implement transportation control measures such as supporting voluntary trip-reduction programs, ridesharing, and implementing facilities.	Has UC Berkeley continued to implement transportation control measures such as supporting voluntary trip reduction programs, ridesharing, and implementing improvements to bicycle facilities?	P&T	O
2020 LRDP EIR MM AIR-5. UC Berkeley will work with the City of Berkeley, ABAG and BAAQMD to ensure that emissions directly and indirectly associated with the campus are adequately accounted for	Has UC Berkeley worked with the City of Berkeley, ABAG and BAAQMD to ensure that emissions associated with the campus are adequately accounted for and mitigated in applicable air quality	EH&S, PEP	O

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
and mitigated in applicable air quality planning efforts.	planning efforts?		
Biological Resources			
2020 LRDP EIR MM BIO-1-a. UC Berkeley will, to the full feasible extent, avoid the disturbance or removal of nests of raptors and other special-status bird species when in active use. A pre-construction nesting survey for loggerhead shrike or raptors, covering a 100 yard perimeter of the project site, would be conducted during the months of March through July prior to commencement of any project that may impact suitable nesting habitat on the Campus Park and Hill Campus. The survey would be conducted by a qualified biologist no more than 30 days prior to initiation of disturbance to potential nesting habitat. In the Hill Campus, surveys would be conducted for new construction projects involving removal of trees and other natural vegetation. In the Campus Park, surveys would be conducted for construction projects involving removal of mature trees within 100 feet of a Natural Area, Strawberry Creek, and the Hill Campus. If any of these species are found within the survey area, grading and construction in the area would not commence, or would continue only after the nests are protected by an adequate setback approved by a qualified biologist. To the full feasible extent, the nest location would be preserved, and alteration would only be allowed if a qualified biologist verifies that birds have either not begun egg-laying and incubation, or that the juveniles from those nests are foraging independently and capable of survival. A pre-construction survey is not required if construction activities commence during the non-nesting season (August through February).	a) Has the project avoided the disturbance or removal of nests of raptors and other special-status bird species when in active use? b) Was a preconstruction nesting survey for loggerhead shrike or raptors, including a 100-yard site buffer, conducted by a qualified biologist prior to C-phase, between March 1 - July 31 and 30 days or less prior to disturbance to potential nesting habitat? c) Will the project remove mature trees within 100 feet of a Natural Area, Strawberry Creek, and/or the Hill Campus? d) If the answer to (c) is "yes", has a qualified biologist surveyed the site and established adequate nest setbacks where raptors or other special-status bird species have been found? e) If special-status bird species or raptors nest in the site or the zone described in (c), have nest locations been preserved, or altered only with approval of a qualified biologist?	PM, OEP	P and W
2020 LRDP EIR CBP BIO-1-a. UC Berkeley will continue to implement the Campus Specimen Tree Program to reduce adverse effects to specimen trees and flora. Replacement landscaping will be provided where specimen resources are adversely affected, either through salvage and relocation of existing trees and shrubs or through new plantings of the same genetic strain, as directed by the Campus Landscape Architect.	a) Has the Campus Specimen Tree Program been implemented to reduce adverse impacts to specimen trees and flora? b) Has replacement landscaping as directed by the CLA been provided where specimen resources are adversely affected?	PM, OEP	P
2020 LRDP EIR CBP BIO-1-c. Because trees and other vegetation require routine maintenance, as trees age and become senescent, UC Berkeley would continue to undertake trimming, thinning, or removal, particularly if trees become a safety hazard.	a) Has UC Berkeley continued to trim, thin, or remove vegetation, especially where trees have become a safety hazard? b) Does the fire safety program continue to remove mature trees as necessary?	PP-CS, OEP	O

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
Cultural Resources			
MM-CUL-1: Prior to approval of final design plans for the Upper Hearst Development, UC Berkeley shall retain a historic architect meeting the National Park Service Professional Qualifications Standards for historic architecture to review plans for the proposed academic and residential buildings. The historic architect shall provide input and refinements to the design team regarding modifications to the palette of exterior materials to improve compatibility with neighboring historical resources and compliance with the Secretary of the Interior's Standards. This review shall include, but not be limited to, suggestions for incorporating exterior materials, such as wood or brick, in the design.	a) Has a historic architect been retained to review plans? b) Has the architect provided input and refinements to the design team regarding modifications to the palette of exterior materials to improve compatibility with neighboring historical resources and compliance with the Secretary of the Interior's Standards?	PM	P
2020 LRDP EIR CBP CUL-1. In the event that paleontological resource evidence or a unique geological feature is identified during project planning or construction, the work would stop immediately and the find would be protected until its significance can be determined by a qualified paleontologist or geologist. If the resource is determined to be a 'unique resource,' a mitigation plan would be formulated and implemented to appropriately protect the significance of the resource by preservation, documentation, and/or removal, prior to recommencing activities.	a) Has any paleontological resource evidence or a unique geological feature been identified during project planning or construction?	PM, OEP	W
	b) If the answer to (a) is "yes" during C-phase, did work stop immediately and was the find protected, until its significance was determined by a qualified paleontologist or geologist?	PM, OEP	C
	c) If the answer to (a) is "yes", was the resource determined to be a "unique resource"?		
	d) If the answer to (c) is "yes", was a mitigation plan formulated and implemented to protect the resource significance by preservation, documentation, and/or removal, prior to recommencing activities?		
2020 LRDP EIR CBP CUL-2-a. If a project could cause a substantial adverse change in features that convey the significance of a primary or secondary resource, an Historic Structures Assessment (HSA) would be prepared. Recommendations of the HSA made in accordance with the Secretary of the Interior's Standards would be implemented, in consultation with the UC Berkeley Design Review Committee and the State Historic Preservation Office, such that the integrity of the significant resource is preserved and protected. Copies of all reports would be filed in the University Archives/Bancroft Library.	a) Could the project cause a substantial adverse change in features that convey the significance of a primary or secondary resource?	PEP	P
	b) If the answer to (a) is "yes", was an Historic Structures Assessment (HSA) prepared, and recommendations made in accordance with the Secretary of the Interior's Standards?		
	c) If the answer to (b) is "yes", were the HAS recommendations implemented, in consultation with the DRC and the State Historic Preservation Office?		
	d) If the answer to (b) is "yes", was a copy of the HSA filed in the University Archives/Bancroft Library?		
2020 LRDP EIR CBP CUL-2-b. UC Berkeley would make informational presentations of all major projects in the City Environs in Berkeley to the Berkeley Planning Commission and, if relevant, the Berkeley Landmarks Commission for comment prior to schematic design review by the UC Berkeley Design Review Committee. Major projects in the	Has UC Berkeley made informational presentations on this project to the appropriate Planning Commission and, if relevant, to the appropriate Landmarks Preservation Commission or Advisory Board?	PEP	P

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
City Environs in Oakland would similarly be presented to the Oakland Planning Commission and, if relevant, to the Oakland Landmarks Preservation Advisory Board.			
2020 LRDP EIR MM CUL-3. If, in furtherance of the educational mission of the University, a project would require the demolition of a primary or secondary resource, or the alteration of such a resource in a manner not in conformance with the Secretary of the Interior's Standards, the resource would be recorded to archival standards prior to its demolition or alteration.	<p>a) Does the project require the demolition of a primary or secondary resource, or the alteration of such a resource in a manner not in conformance with the Secretary of the Interior's Standards?</p> <p>b) If the answer to (a) is "yes", has the resource been recorded to archival standards prior to demolition or alteration?</p>	PM	P
<p>2020 LRDP EIR CBP CUL-4-a. In the event resources are determined to be present at a project site, the following actions would be implemented as appropriate to the resource and the proposed disturbance:</p> <ul style="list-style-type: none"> UC Berkeley shall retain a qualified archaeologist to conduct a subsurface investigation of the project site, to ascertain the extent of the deposit of any buried archaeological materials relative to the project's area of potential effects. The archaeologist would prepare a site record and file it with the California Historical Resource Information System. If the resource extends into the project's area of potential effects, the resource would be evaluated by a qualified archaeologist. UC Berkeley as lead agency would consider this evaluation in determining whether the resource qualifies as a historical resource or a unique archaeological resource under the criteria of CEQA Guidelines section 15064.5. If the resource does not qualify, or if no resource is present within the project area of potential effects, this would be noted in the environmental document and no further mitigation is required unless there is a discovery during construction (see below). If a resource within the project area of potential effect is determined to qualify as an historical resource or a unique archaeological resource in accordance with CEQA, UC Berkeley shall consult with a qualified archaeologist to mitigate the effect through data recovery if appropriate to the resource, or to consider means of avoiding or reducing ground disturbance within the site boundaries, including minor modifications of building footprint, landscape modification, the placement of protective fill, the 	<p>a) Have resources been found at the project site? If yes, answer (b) thru (e) below; otherwise, enter "n/a" for Questions (b) thru (e).</p> <p>b) Has a qualified archaeologist done subsurface investigation ascertaining extents of buried archaeological materials within project's area of potential impacts, and filed a site record with the California Historical Resource Information System, Bancroft Library / University Archives, and Northwest Information Center?</p> <p>c) Has UC Berkeley considered the archaeologist's report in determining whether the resource qualifies as a historical resource or a unique archaeological resource under CEQA Guidelines Section 15064.5?</p> <p>d) If the resource does not qualify under CEQA Section 15064.5, or if no resource is present, has this outcome been noted in the environmental document?</p> <p>e) If a resource does qualify, has a consulting archaeologist stipulated appropriate mitigations?</p>	PEP	P

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
<p>establishment of a preservation easement, or other means that would permit avoidance or substantial preservation in place of the resource. If further data recovery, avoidance or substantial preservation in place is not feasible, UC Berkeley shall implement LRDP Mitigation Measure CUL-5, outlined below.</p> <ul style="list-style-type: none"> A written report of the results of investigations would be prepared by a qualified archaeologist and filed with the University Archives/ Bancroft Library and the Northwest Information Center. 			
2020 LRDP EIR MM CUL-4-b. If a resource is discovered during construction (whether or not an archaeologist is present), all soil disturbing work within 35 feet of the find shall cease. UC Berkeley shall contact a qualified archaeologist to provide and implement a plan for survey, subsurface investigation as needed to define the deposit, and assessment of the remainder of the site within the project area to determine whether the resource is significant and would be affected by the project, as outlined in Continuing Best Practice CUL-3-a. UC Berkeley would implement the recommendations of the archaeologist.	<p>a) Has a cultural resource been discovered during construction?</p> <p>b) If the answer to (a) is "yes", did all soil-disturbing work within 35 feet immediately cease?</p> <p>c) If the answer to (a) is "yes", did the project have a qualified archaeologist survey, investigate subsurface to define the deposit, and assess the entire site to determine whether the resource is significant and would be affected by the project?</p> <p>d) Has the project implemented the recommendations of the archaeologist?</p>	PM, OEP	C
2020 LRDP EIR CBP CUL-4-b. In the event human or suspected human remains are discovered, UC Berkeley would notify the County Coroner who would determine whether the remains are subject to his or her authority. The Coroner would notify the Native American Heritage Commission if the remains are Native American. UC Berkeley would comply with the provisions of Public Resources Code Section 5097.98 and CEQA Guidelines Section 15064.5(d) regarding identification and involvement of the Native American Most Likely Descendant and with the provisions of the California Native American Graves Protection and Repatriation Act to ensure that the remains and any associated artifacts recovered are repatriated to the appropriate group, if requested.	<p>a) Have (suspected) human remains been found at the project site?</p> <p>b) If the answer to (a) is "yes", was the County Coroner immediately notified?</p> <p>c) If the answer to (a) is "yes", did the project comply with Public Resources Code Section 5097.98, with CEQA Guidelines Section 15064.5(d), and with NAGPRA re notification of the appropriate Native American representatives?</p>	PM, OEP	C
<p>2020 LRDP EIR CBP CUL-4-c. If, in furtherance of the educational mission of the University, a project would require damage to or demolition of a significant archaeological resource, a qualified archaeologist shall, in consultation with UC Berkeley:</p> <ul style="list-style-type: none"> Prepare a research design and archaeological data recovery plan that would attempt to capture those categories of data for which the site is significant, and implement the data 	<p>Have all contractors who have reason to disturb site soils been notified by the project that they are required to watch for potential archaeological sites and artifacts and to notify UC Berkeley if any are found?</p>	PM, OEP	W

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
<p>recovery plan prior to or during development of the site.</p> <ul style="list-style-type: none"> Perform appropriate technical analyses, prepare a full written report and file it with the appropriate information center, and provide for the permanent curation of recovered materials. 			
<p>2020 LRDP EIR MM CUL-5. If, in furtherance of the educational mission of the University, a project would require damage to or demolition of a significant archaeological resource, a qualified archaeologist shall, in consultation with UC Berkeley:</p> <ul style="list-style-type: none"> Prepare a research design and archaeological data recovery plan that would attempt to capture those categories of data for which the site is significant, and implement the data recovery plan prior to or during development of the site. Perform appropriate technical analyses, prepare a full written report and file it with the appropriate information center, and provide for the permanent curation of recovered materials. 	<p>a) Does this project require damage to or demolition of a significant archaeological resource?</p> <p>b) If the answer to (a) is "yes", has a qualified archaeologist -- in consultation with UC Berkeley -- prepared a research design/data recovery plan, performed appropriate technical analyses, and written and appropriately filed a full report, and arranged permanent curation of recovered materials?</p> <p>c) If the answer to (a) is "yes", has the archaeologist -- in consultation with UC Berkeley -- provided for permanent curation of recovered materials?</p>	PEP	P
Geology, Seismicity, and Soils			
2020 LRDP CBP GEO-1-a. UC Berkeley will continue to comply with the California Building Code and the University Policy on Seismic Safety.	Has the project complied with the California Building Code and the University Policy on Seismic Safety?	PM	P
2020 LRDP CBP GEO-1-b. Site-specific geotechnical studies will be conducted under the supervision of a California Registered Engineering Geologist or licensed geotechnical engineer and UC Berkeley will incorporate recommendations for geotechnical hazard prevention and abatement into project design.	<p>a) Have site-specific geotechnical studies been conducted under the supervision of a California Registered Engineering Geologist or licensed geotechnical engineer?</p> <p>b) Has the project incorporated the Geologist's recommendations for geotechnical hazard prevention and abatement into project design?</p>	PM	P
2020 LRDP CBP GEO-1-c. The Seismic Review Committee (SRC) shall continue to review all seismic and structural engineering design for new and renovated existing buildings on campus and ensure that it conforms to the California Building Code and the University Policy on Seismic Safety.	Has SRC reviewed the seismic and structural design for this project, to ensure that it conforms to the California Building Code and the University Policy on Seismic Safety?	PM	P
2020 LRDP CBP GEO-1-d. UC Berkeley shall continue to use site-specific seismic ground motion specifications developed for analysis and design of campus projects. The information provides much greater detail than conventional codes and is used for performance-based analyses.	Does the project use site-specific seismic ground motion specifications?	PM	P

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
2020 LRDP CBP GEO-1-g. As stipulated in the University Policy on Seismic Safety, the design parameters for specific site peak acceleration and structural reinforcement will be determined by the geotechnical and structural engineer for each new or rehabilitation project proposed under the 2020 LRDP. The acceptable level of actual damage that could be sustained by specific structures would be calculated based on geotechnical information obtained at the specific building site.	a) Have the design parameters for specific site peak acceleration and structural reinforcement been determined by the geotechnical and structural engineer for this project? b) Has the acceptable level of actual damage that could be sustained by the project been calculated based on geotechnical information obtained on-site?	PM	P
2020 LRDP CBP GEO-1-i. The site-specific geotechnical studies conducted under GEO-1-b will include an assessment of landslide hazard, including seismic vibration and other factors contributing to slope stability.	Has an assessment of landslide hazard, including seismic vibration and other factors contributing to slope stability, been included in the geotechnical study specified in GEO1-b, above?	PM	P
2020 LRDP CBP GEO-2. Campus construction projects with potential to cause erosion or sediment loss, or discharge of other pollutants, would include the campus Stormwater Pollution Prevention Specification. This specification includes by reference the "Manual of Standards for Erosion and Sediment Control" of the Association of Bay Area Governments and requires that each large and exterior project develop an Erosion Control Plan.	Does the project construction contract include and require execution of the campus Stormwater Pollution Prevention Specification?	PM, OEP	W
	Has an EH&S-approved Erosion Control Plan been prepared for this project?	PM, OEP	W and C
Greenhouse Gas Emissions			
MM-GHG-1. By May 1, 2021, if necessary, UC Berkeley shall purchase sufficient carbon offsets and/or renewable energy certificates within the State of California to reduce annual campus-wide greenhouse gas emissions to 1990 baseline levels. With such reductions in GHG emissions, UC Berkeley shall meet the GHG reduction target in the UC Sustainable Practices Policy for the year 2020, which would ensure consistency with the statewide target established by AB 32. If necessary, by May 1, 2026, UC Berkeley shall purchase carbon offsets and/or renewable energy certificates to achieve campus-wide carbon neutrality in Scope 1 and 2 emissions by 2025, consistent with the UC Sustainable Practices Policy.	Have carbon offsets and/or renewable energy certificates been purchased as necessary?	PEP	O
2020 LRDP CBP CLI-1. UC Berkeley would continue to implement provisions of the UC Policy on Sustainable Practices including, but not limited to: Green Building Design; Clean Energy Standards; Climate Protection Practices; Sustainable Transportation Practices; Sustainable Operations; Recycling and Waste Management; and Environmentally Preferable Purchasing Practices.	a) Has the project implemented provisions of the UC Policy on Sustainable Practices as feasible?	PM, PEP	P and O
2020 LRDP CBP CLI-2. UC Berkeley would continue to implement	a) Has the project implemented energy conservation measures into the	PM, PEP	P and O

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
energy conservation measures (such as energy-efficient lighting and microprocessor-controlled HVAC equipment) to reduce the demand for electricity and natural gas. The energy conservation measures may be subject to modification as new technologies are developed or if current technologies become obsolete through replacement.	project design to reduce the demand for electricity and natural gas to the extent feasible?		
2020 LRDP CBP CLI-3. UC Berkeley would continue to annually monitor and report upon its progress toward its greenhouse gas emission targets. UC Berkeley would continue to report actions undertaken in the past year, and update its climate action plan annually to specify actions that UC Berkeley is planning to undertake in the current year and future years to achieve emission targets.	a) Has the campus monitored and reported its progress toward its greenhouse gas emission targets? b) Has the climate action plan been updated annually to specify actions that the campus is planning to undertake in the current and future years to achieve emission targets?	EH&S, PEP	O
Hazardous Materials			
2020 LRDP CBP HAZ-4. UC Berkeley shall continue to perform site histories and due diligence assessments of all sites where ground-disturbing construction is proposed, to assess the potential for soil and groundwater contamination resulting from past or current site land uses at the site or in the vicinity. The investigation will include review of regulatory records, historical maps and other historical documents, and inspection of current site conditions. UC Berkeley would act to protect the health and safety of workers or others potentially exposed should hazardous site conditions be found.	a) Has the project performed a site history and due diligence assessments of potential for soil and groundwater contamination resulting from past or current site land uses, where ground-disturbing construction is proposed? b) Did the investigation include review of regulatory records, historical maps and other historical documents, and inspection of current site conditions? c) Were hazardous site conditions (conditions exposing humans to hazardous materials risks) found during the requisite investigations?	PM	P
	d) If the answer to (c) above is "yes", has the project protected the health and safety of workers or others potentially exposed, should hazardous site conditions be found?	PM	W and C
2020 LRDP CBP HAZ-5. UC Berkeley shall continue to perform hazardous materials surveys prior to capital projects in existing campus buildings. The campus shall continue to comply with federal, state and local regulations governing the abatement and handling of hazardous materials and each project shall address this requirement in all construction.	Has the project performed a hazardous materials survey prior to commencement of site work?	PM	W
	Has the project complied, in all aspects of construction, with all applicable federal, state, and local regulations governing the abatement and handling of hazardous building materials?	PM	C
Hydrology and Water Quality			
2020 LRDP CBP HYD-1-a. During the plan check review process and construction phase monitoring, UC Berkeley (EH&S) will verify that the proposed project complies with all applicable requirements and BMPs.	During the plan check review process and construction phase monitoring, has EH&S verified that the proposed project complies with all applicable requirements and BMPs?	PM, EH&S	W and C
2020 LRDP CBP HYD-1-b. UC Berkeley shall continue implementing	a) Has UC Berkeley continued to implement an urban runoff	EH&S	O

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
an urban runoff management program containing BMPs as published in the Strawberry Creek Management Plan, and as developed through the campus municipal Stormwater Management Plan (SWMP) completed for its pending Phase II MS4 NPDES permit. UC Berkeley will continue to comply with the NPDES stormwater permitting requirements by implementing construction and post construction control measures and BMPs required by project-specific SWPPPs and, upon its approval, by the Phase II SWMP to control pollution. SWPPPs would be prepared as required by the appropriate regulatory agencies including the Regional Water Quality Control Board and where applicable, according to the UC Berkeley Stormwater Pollution Prevention Specification to prevent discharge of pollutants and to minimize sedimentation resulting from construction and the transport of soils by construction vehicles.	management program containing BMPs as published in the Strawberry Creek Management Plan, and as developed through the campus municipal Stormwater Management Plan? b) Has UC Berkeley continued to implement construction and post construction control measures and BMPs required by project-specific SWPPPs and by the Phase II SWMP? c) Have plans been prepared as required by the appropriate regulatory agencies and, where applicable, according to the UC Berkeley Stormwater Pollution Prevention Specification?		
2020 LRDP CBP HYD-2-a. In addition to Hydrology Continuing Best Practices 1-a and 1-b above, UC Berkeley will continue to review each development project, to determine whether project runoff would increase pollutant loading. If it is determined that pollutant loading could lead to a violation of the Basin Plan, UC Berkeley would design and implement the necessary improvements to treat stormwater. Such improvements could include grassy swales, detention ponds, continuous centrifugal system units, catch basin oil filters, disconnected downspouts and stormwater planter boxes.	a) Has the project been reviewed to determine whether project runoff would increase pollutant loading? b) Has it been determined through EH&S review that pollutant loading could lead to a violation of the Basin Plan? c) If the answer to (b) above is "yes", has the project designed and implemented the necessary improvements to treat stormwater?	PM	P and W
2020 LRDP CBP HYD-2-b. Where feasible, parking would be built in covered parking structures and not exposed to rain to address potential stormwater runoff pollutant loads. See also HYD-2-a.	Will the parking for this project be built in covered parking structures and not exposed to rain?	PEP	P
2020 LRDP CBP HYD-2-c. Landscaped areas of development sites shall be designed to absorb runoff from rooftops and walkways. The Campus Landscape Architect shall ensure open or porous paving systems be included in project designs wherever feasible, to minimize impervious surfaces and absorb runoff.	a) Have landscaped areas of the site been designed to absorb runoff from rooftops and walkways? b) Has the Campus Landscape Architect ensured that open or porous paving systems have been included in this project, wherever feasible?	PM	P
2020 LRDP CBP HYD-3. In addition to Best Practices 1-a, 1-b, 2-a and 2-c above, UC Berkeley will continue to review each development project, to determine whether rainwater infiltration to groundwater is affected. If it is determined that existing infiltration rates would be adversely affected, UC Berkeley would design and implement the necessary improvements to retain and infiltrate stormwater. Such improvements could include retention basins to collect and retain	a) Has the project been reviewed to determine whether rainwater infiltration to groundwater is adversely affected by the design? b) Would the design adversely affect rainwater infiltration to groundwater? c) If the answer to (b) above is "yes", has the project designed and implemented improvements to retain and infiltrate stormwater, and maintain the volume of flows and times of concentration at pre-	PM	P

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
runoff, grassy swales, infiltration galleries, planter boxes, permeable pavement, or other retention methods. The goal of the improvement should be to ensure that there is no net decrease in the amount of water recharged to groundwater that serves as freshwater replenishment to Strawberry Creek. The improvement should maintain the volume of flows and times of concentration from any given site at pre-development conditions.	development conditions?		
2020 LRDP CBP HYD-4-a. In addition to Hydrology Continuing Best Practices 1-a, 1-b, and 2-c, the campus storm drain system would be maintained and cleaned to accommodate existing runoff.	Has the campus storm drain system been maintained and cleaned to accommodate existing runoff?	PP-CS	O
2020 LRDP CBP HYD-4-b. For 2020 LRDP projects in the City Environs (excluding the Campus Park or Hill Campus) improvements would be coordinated with the City Public Works Department.	Has this project been coordinated with the City Public Works Department?	PM, PEP	P
2020 LRDP CBP HYD-4-e. UC Berkeley shall continue to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions.	Has UC Berkeley continued to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions?	PEP, EH&S, PP-CS	O
Land Use			
2020 LRDP CBP LU-2-b. UC Berkeley would make informational presentations of all major projects in the City Environs in Berkeley to the Berkeley Planning Commission and, if relevant, the Berkeley Landmarks Preservation Commission for comment prior to schematic design review by the UC Berkeley Design Review Committee. Major projects in the City Environs in Oakland would similarly be presented to the Oakland Planning Commission and, if relevant, to the Oakland Landmarks Preservation Advisory Board. Whenever a project in the City Environs is under consideration by the UC Berkeley DRC, a staff representative designated by the city in which it is located would be invited to attend and comment on the project.	a) Has the project been presented to the Berkeley or Oakland Planning Commission and Berkeley or Oakland Landmarks (Preservation) Commission/ Advisory Board (if relevant) for comment prior to schematic design review by the UC Berkeley DRC? b) For a project in the City Environs, has a staff representative designated by the city in which the project is located been invited to attend the UC Berkeley DRC to comment on the project?	PEP	P
2020 LRDP CBP LU-2-c. Each individual project built in the Hill Campus or the City Environs under the 2020 LRDP would be assessed to determine whether it could pose potential significant land use impacts not anticipated in the 2020 LRDP, and if so, the project would be subject to further evaluation under CEQA. In general, a project in the Hill Campus or the City Environs would be assumed to have the potential for significant land use impacts if it: ▪ Includes a use that is not permitted within the city general	a) If the project is within the Hill Campus or the City Environs, has it been assessed to determine whether it could pose potential significant land use impacts not anticipated in the 2020 LRDP? b) If the answer to (a) is "yes", could the project pose potential significant land use impacts not anticipated in the 2020 LRDP? c) If the answer to (b) is yes, has the project been further evaluated per CEQA?	PEP	P

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
<ul style="list-style-type: none"> plan designation for the project site, or Has a greater number of stories and/or lesser setback dimensions than could be permitted for a project under the relevant city zoning ordinance as of July 2003. 			
Noise			
2020 LRDP EIR CBP NOI-2. Mechanical equipment selection and building design shielding would be used, as appropriate, so that noise levels from future building operations would not exceed the City of Berkeley Noise Ordinance limits for commercial areas or residential zones as measured on any commercial or residential property in the area surrounding a project proposed to implement the 2020 LRDP. Controls that would typically be incorporated to attain this outcome include selection of quiet equipment, sound attenuators on fans, sound attenuator packages for cooling towers and emergency generators, acoustical screen walls, and equipment enclosures.	Does the project design use shielding and mechanical equipment such that building operations noise would not exceed CoB Noise Ordinance limits, as measured on any commercial or residential property adjacent to the project?	PM	P
2020 LRDP EIR MM NOI-3. The University would comply with building standards that reduce noise impacts to residents of University housing to the full feasible extent; additionally, any housing built in areas where noise exposure levels exceed 60 Ldn would incorporate design features to minimize noise exposures to occupants.	<p>a) Does the proposed University housing project comply with building standards that reduce noise impacts to residents of University housing to the full feasible extent?</p> <p>b) Is this housing project in an area where noise exposure levels exceed 60Ldn?</p> <p>c) If the answer to (b) is "yes", does this project incorporate design features to minimize noise exposures to occupants?</p>	PM	P
<p>2020 LRDP EIR CBP NOI-4-a. The following measures would be included in all construction projects:</p> <ul style="list-style-type: none"> Construction activities will be limited to a schedule that minimizes disruption to uses surrounding the project site as much as possible. Construction outside the Campus Park area will be scheduled within the allowable construction hours designated in the noise ordinance of the local jurisdiction to the full feasible extent, and exceptions will be avoided except where necessary. As feasible, construction equipment will be required to be muffled or controlled. The intensity of potential noise sources will be reduced where feasible by selection of quieter equipment (e.g. gas or electric equipment instead of diesel powered, low noise air compressors). 	<p>a) Has construction been scheduled to minimize disruption to surrounding uses, and -- if in the Campus Environs -- scheduled within the applicable jurisdiction's noise ordinance allowable construction hours to the full feasible extent, and exceptions avoided?</p> <p>b) Has construction equipment been muffled, controlled, or selected as the quieter feasible equipment option?</p> <p>c) Have noisy construction functions been performed off-site whenever possible?</p> <p>d) Does the project require pile driving?</p> <p>e) If the answer to (d) is "yes", have: pile holes been pre-drilled; pile-driving scheduled to minimize impacts on sensitive receptors; quietest technology been used; and, oscillating or rotating pile installation been used rather than impact hammers?</p>	PM	W and C

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
<ul style="list-style-type: none"> Functions such as concrete mixing and equipment repair will be performed off-site whenever possible. <p>For projects requiring pile driving:</p> <ul style="list-style-type: none"> With approval of the project structural engineer, pile holes will be pre-drilled to minimize the number of impacts necessary to seat the pile. Pile driving will be scheduled to have the least impact on nearby sensitive receptors. Pile drivers with the best available noise control technology will be used. For example, pile driving noise control may be achieved by shrouding the pile hammer point of impact, by placing resilient padding directly on top of the pile cap, and/or by reducing exhaust noise with a sound-absorbing muffler. Alternatives to impact hammers, such as oscillating or rotating pile installation systems, will be used where possible. 			
2020 LRDP EIR CBP NOI-4-b. UC Berkeley would continue to precede all new construction projects with community outreach and notification, with the purpose of ensuring that the mutual needs of the particular construction project and of those impacted by construction noise are met, to the extent feasible.	Has community outreach and notification re this project been implemented prior to construction?	PM	P
2020 LRDP EIR MM NOI-4. UC Berkeley will develop a comprehensive construction noise control specification to implement additional noise controls, such as noise attenuation barriers, siting of construction laydown and vehicle staging areas, and the measures outlined in Continuing Best Practice NOI-4-a as appropriate to specific projects. The specification will include such information as general provisions, definitions, submittal requirements, construction limitations, requirements for noise and vibration monitoring and control plans, noise control materials and methods. This documentation will be modified as appropriate for a particular construction project and included within the construction specification.	Has a comprehensive construction noise control specification been developed, for implementation of noise controls and including general provisions, definitions, submittal requirements, construction limitations, noise/vibration monitoring and control plans, noise control materials and methods?	EH&S	O
	Has the noise specification been modified as appropriate for this project and included within the construction specification for this project?	PM	W
2020 LRDP EIR MM NOI-5. The following measures will be implemented to mitigate construction vibration:	a(i)) Will the project implement pile driving? a(ii)) Will the project construction generate vibration?	PM	P
<ul style="list-style-type: none"> UC Berkeley will conduct a pre-construction survey prior to the start of pile driving. The survey will address susceptibility ratings of structures, proximity of sensitive 	b) If the answer to (a(i)) is "yes", has the site been surveyed for susceptibility ratings of structures, proximity of sensitive receivers and		

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
<p>receivers and equipment/ operations, and surrounding soil conditions. This survey will document existing conditions as a baseline for determining changes subsequent to pile driving.</p> <ul style="list-style-type: none"> UC Berkeley will establish a vibration checklist for determining whether or not vibration is an issue for a particular project. Prior to conducting vibration-causing construction, UC Berkeley will evaluate whether alternative methods are available, such as: Using an alternative to impact pile driving such as vibratory pile drivers or oscillating or rotating pile installation methods. Jetting or partial jetting of piles into place using a water injection at the tip of the pile. If vibration monitoring is deemed necessary, the number, type, and location of vibration sensors would be determined by UC Berkeley. 	<p>equipment/operations, and surrounding soil conditions?</p> <p>c) Has UC Berkeley established a vibration checklist?</p> <p>d) If the answer to (a(ii)) is yes, has the project evaluated such alternative methods as: oscillating, rotating, or vibrating pile driving; and, jetting piles into place via water-injection?</p> <p>e) If the answer to (a(ii)) is "yes" and if vibration monitoring has been deemed necessary, has the project determined/implemented the appropriate number, type, and location of vibration sensors?</p>		
Public Services			
2020 LRDP EIR CBP PUB-1.1. UCPD would continue its partnership with the City of Berkeley police department to review service levels in the City Environs.	Has UCPD continued its partnership with the City of Berkeley police department to review service levels in the City Environs?	UCPD	O
2020 LRDP EIR CBP PUB-2.1-a. UC Berkeley would continue to comply with Title 19 of the California Code of Regulations, which mandates firebreaks of up to 100 feet around buildings or structures in, upon or adjoining any mountainous, forested, brush- or grass-covered lands.	Has UC Berkeley continued to comply with CCR Title 19 regarding firebreaks of up to 100 feet around buildings or structures in, upon or adjoining any mountainous, forested, brush- or grass-covered lands?	CFM, OEP	O
2020 LRDP EIR CBP PUB-2.1-b. UC Berkeley would continue on-going implementation of the Hill Area Fuel Management Program.	Has UC Berkeley continued on-going implementation of the Hill Area Fire Fuel Management Program?	OEP	O
2020 LRDP EIR CBP PUB-2.1-c. UC Berkeley would continue to plan and implement programs to reduce risk of wildland fires, including plan review and construction inspection programs that ensure that campus projects incorporate fire prevention measures.	Has UC Berkeley continued to plan and implement programs to reduce risk of wildland fires, including plan review and construction inspection programs that ensure that campus projects incorporate fire prevention measures?	OEP, PEP, CFM	O
2020 LRDP EIR CBP PUB-2.3. UC Berkeley would continue its partnership with LBNL, ACFD, and the City of Berkeley to ensure adequate fire and emergency service levels to the campus and UC facilities. This partnership shall include consultation on the adequacy	Has UC Berkeley continued its partnership with LBNL, ACFD, and CoB to ensure adequate emergency access routes, fire and emergency service levels to the campus and UC facilities?	PEP, CFM	O

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
of emergency access routes to all new University buildings.			
2020 LRDP EIR MM PUB-2.4-a. In order to ensure adequate access for emergency vehicles when construction projects would result in temporary lane or roadway closures, campus project management staff would consult with the UCPD, campus EH&S, the BFD and ACFD to evaluate alternative travel routes and temporary lane or roadway closures prior to the start of construction activity. UC Berkeley will ensure the selected alternative travel routes are not impeded by UC Berkeley activities.	a) Has the project consulted UCPD, EH&S, BFD and ACFD to evaluate alternative travel routes and temporary lane or roadway closures prior to the start of construction activity? b) Has the project ensured that the selected alternative travel routes are not impeded by UC Berkeley activities?	PM	W and C
2020 LRDP EIR MM PUB-2.4-b. To the extent feasible, the University would maintain at least one unobstructed lane in both directions on campus roadways at all times, including during construction. At any time only a single lane is available due to construction-related road closures, the University would provide a temporary traffic signal, signal carriers (i.e. flagpersons), or other appropriate traffic controls to allow travel in both directions. If construction activities require the complete closure of a roadway, UC Berkeley would provide signage indicating alternative routes. In the case of Centennial Drive, any complete road closure would be limited to brief interruptions of traffic required by construction operations.	a) Has the project maintained at least one unobstructed lane in both directions on campus roadways at all times? b) Where construction has caused only a single lane to be available, has the project provided a temporary traffic signal, signal carriers (i.e. flagpersons), or other appropriate traffic controls to allow travel in both directions? c) When and wherever construction activities require the complete closure of a roadway, has the project provided signage indicating alternative routes? d) If the project occurs at Centennial Drive, would roadway interruptions caused by construction be brief?	PM	C
2020 LRDP EIR CBP PUB-2.4. To the extent feasible, for all projects in the City Environs, the University would include the undergrounding of surface utilities along project street frontages, in support of City of Berkeley General Plan Policy S-22.	If the project is in the City Environs, will it underground utilities along street frontages?	PEP, PM	P
	Has the project in the City Environs undergrounded utilities along street frontages?	PM	W and C
Transportation and Traffic			
MM-T-1. Prior to occupancy of the Upper Hearst Development, UC Berkeley shall prepare and approve a transportation management plan for special events at the proposed academic building that are expected to have at least 200 external attendees. Once the Upper Hearst Development is in operation, UC Berkeley shall implement the plan, which shall include a menu of options for UC Berkeley to implement to minimize the effect of special events on traffic congestion near the Project site, which may include but are not limited to:	Has a transportation management plan been prepared and approved?	PM, P&T	P
<ul style="list-style-type: none"> ▪ Scheduling events during non-peak times (evenings and weekends), to the extent feasible ▪ Informing event attendees of appropriate parking and pick-up/drop-off locations 			

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
<ul style="list-style-type: none"> Considering the posting of flagpersons to manage pick-up and drop-off activity on Hearst Avenue and/or vehicles entering and exiting the Upper Hearst parking structure Considering monitoring of traffic conditions during special events and modifying the transportation management plan as appropriate 			
MM-T-2. To minimize blockage of the driveway to the Upper Hearst parking structure on La Loma Avenue, UC Berkeley shall coordinate with the City of Berkeley to provide "KEEP CLEAR" pavement markings on southbound La Loma Avenue adjacent to the driveway.	Have "KEEP CLEAR" pavement markings been painted?	PM, P&T	C
2020 LRDP EIR CBP TRA-1-b. UC Berkeley will continue to do strategic bicycle access planning. Issues addressed include bicycle access, circulation and amenities with the goal of increasing bicycle commuting and safety. Planning considers issues such as bicycle access to the campus from adjacent streets and public transit; bicycle, vehicle, and pedestrian interaction; bicycle parking; bicycle safety; incentive programs; education and enforcement; campus bicycle routes; and amenities such as showers.	a) Has UC Berkeley continued strategic bicycle access planning, including bicycle access, circulation and amenities to increase bicycle commuting and safety?	P&T	O
	b) Have bicycle access improvements been considered in the scoping and budgeting of the project?	PEP, PM	P
2020 LRDP EIR CBP TRA-2. The following housing and transportation policies will be continued: <ul style="list-style-type: none"> Except for disabled students, students living in UC Berkeley housing would only be eligible for a daytime student fee lot permit or residence hall parking based upon demonstrated need, which could include medical, employment, academic or other criteria. An educational and informational program for students on commute alternatives would be expanded to include all new housing sites. 	a) Do students living in UCB housing continue to only be eligible for a daytime student fee lot permit or residence hall parking based upon demonstrated need (medical, employment, academic and other criteria)? b) Has an educational and informational program for students on commute alternatives been expanded to include all new housing sites?	RSSP	O
2020 LRDP EIR MM TRA-2. The planned parking supply for University housing projects under the 2020 LRDP EIR would comply with the relevant municipal zoning ordinance as of July 2003. Where the planned parking supply included in a University housing project would make it ineligible for approval under the subject ordinance, UC Berkeley would conduct further review of parking demand and supply in accordance with CEQA.	a) For a proposed housing project, does the planned parking supply comply with the relevant municipal zoning ordinance as of July 2003? b) If the answer to (a) is "no", has UC Berkeley conducted further review of parking demand and supply in accordance with CEQA?	PEP	P
2020 LRDP EIR CBP TRA-3-a. Early in construction period planning UC Berkeley shall meet with the contractor for each construction project to describe and establish best practices for reducing construction-period impacts on circulation and parking in the vicinity	Early in construction period planning, did the project meet with the contractor to describe and establish best practices for reducing construction-period impacts on circulation and parking in the vicinity	PM	W and C

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
of the project site.	of the project site?		
<p>2020 LRDP EIR CBP TRA-3-b. For each construction project, UC Berkeley will require the prime contractor to prepare a Construction Traffic Management Plan which will include the following elements:</p> <ul style="list-style-type: none"> Proposed truck routes to be used, consistent with the City truck route map. Construction hours, including limits on the number of truck trips during the a.m. and p.m. peak traffic periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m.), if conditions demonstrate the need. Proposed employee parking plan (number of spaces and planned locations). Proposed construction equipment and materials staging areas, demonstrating minimal conflicts with circulation patterns. Expected traffic detours needed, planned duration of each, and traffic control plans for each. 	<p>a) Has the project required the prime contractor to prepare a Construction Traffic Management Plan (CTMP)?</p> <p>b) Has such a plan been prepared?</p> <p>c) Does the CTMP include: truck routes consistent with City route map; construction hours w/# truck trips limited 7:00 – 9:00 a.m., 4:00 – 6:00 p.m.; crew parking plan (# of spaces, locations); staging areas minimizing conflicts; detours, including duration and traffic control plan?</p>	PM	W
2020 LRDP EIR CBP TRA-3-c. UC Berkeley will manage project schedules to minimize the overlap of excavation or other heavy truck activity periods that have the potential to combine impacts on traffic loads and street system capacity, to the extent feasible.	To the extent feasible, has the project schedule minimized overlap of excavation or other heavy truck activity that could cumulatively impact traffic loads and street system capacity?	PM	W and C
2020 LRDP EIR CBP TRA-5. The University shall continue to work to coordinate local transit services as new academic buildings, parking facilities, and campus housing are completed, in order to accommodate changing demand locations or added demand.	Has the University continued to coordinate local transit services, in order to accommodate changing demand locations or added demand?	P&T	O
2020 LRDP EIR CBP PUB-2.3. UC Berkeley would continue its partnership with LBNL, ACFD, and the City of Berkeley to ensure adequate fire and emergency service levels to the campus and UC facilities. This partnership shall include consultation on the adequacy of emergency access routes to all new University buildings.	Has UC Berkeley continued its partnership with LBNL, ACFD, and CoB to ensure adequate emergency access routes, fire and emergency service levels to the campus and UC facilities?	PEP, CFM	O
Utilities and Service Systems			
MM-UTIL-1. Existing wastewater collection systems serving the Upper Hearst Development shall be rehabilitated or replaced to ensure that such systems are free from defects or disconnected from the sanitary sewer system. Any new or replacement wastewater collection system infrastructure required to serve the Upper Hearst Development, including sewer lateral lines, shall be constructed to prevent	a) Have existing wastewater collection systems been rehabilitated or replaced in a manner that prevents infiltration/inflow to the maximum extent feasible?	PM	P and C

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
infiltration/inflow to the maximum extent feasible.			
2020 LRDP EIR CBP USS-1.1. For campus development that increases water demand, UC Berkeley would continue to evaluate the size of existing distribution lines as well as pressure of the specific feed affected by development on a project-by-project basis, and necessary improvements would be incorporated into the scope of work for each project to maintain current service and performance levels. The design of the water distribution system, including fire flow, for new buildings would be coordinated among UC Berkeley staff, EBMUD, and the Berkeley Fire Department.	a) Has UC Berkeley continued to evaluate size of existing distribution lines as well as pressure of specific feeds affected by development on a project-by-project basis? b) Has the design of the water distribution system, including fire flow, been coordinated among UC Berkeley staff, EBMUD, and the Berkeley Fire Department?	PP-CS, PM	P and W
	Have necessary improvements been incorporated into the scope of work for each project to maintain current service and performance levels?	PM	P and W
2020 LRDP EIR CBP USS-2.1-a. UC Berkeley will promote and expand the central energy management system (EMS), to tie building water meters into the system for flow monitoring.	Has UC Berkeley promoted and expanded the central energy management system (EMS), to tie building water meters into the system for flow monitoring?	PP-CS	O
2020 LRDP EIR CBP USS-2.1-b. UC Berkeley will analyze water and sewer systems on a project-by-project basis to determine specific capacity considerations in the planning of any project proposed 2020 under the LRDP.	Has the project analyzed water and sewer systems to determine specific capacity considerations?	PEP, PP-CS, PM	P and I W
2020 LRDP EIR CBP USS-2.1-c. UC Berkeley will continue and expand programs retrofitting plumbing in high-occupancy buildings and seek funding for these programs from EBMUD or other outside agencies as appropriate.	Has UC Berkeley continued and expanded programs retrofitting plumbing in high-occupancy buildings, and sought funding for these programs from EBMUD or other outside agencies as appropriate?	PP-CS	O
2020 LRDP EIR CBP USS-2.1-d. UC Berkeley will continue to incorporate specific water conservation measures into project design to reduce water consumption and wastewater generation. This could include the use of special air-flow aerators, water-saving shower heads, flush cycle reducers, low-volume toilets, weather based or evapotranspiration irrigation controllers, drip irrigation systems, the use of drought resistant plantings in landscaped areas, and collaboration with EBMUD to explore suitable uses of recycled water.	Has the project incorporated specific water conservation measures into project design?	PM	P
2020 LRDP EIR CBP USS-3.1. UC Berkeley shall continue to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions.	Has the project been designed to ensure that it will not contribute to net increase in runoff over existing conditions?	PM, EH&S, PP-CS	P
	Has UC Berkeley continued to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions?	EH&S, PP-CS	O
2020 LRDP EIR CBP USS-3.2. In addition to Best Practice USS-3.1, projects proposed with potential to alter drainage patterns in the Hill Campus would be accompanied by a hydrologic modification analysis,	a) For a project with potential to alter drainage in the Hill Campus, has the project performed a hydrologic modification analysis?	OEP, PM	P

Mitigation Measure or Continuing Best Practice	Question for Checklist	Responsible for Implementation	When Implemented
and would incorporate a plan to prevent increases of flow from the project site, preventing downstream flooding and substantial siltation and erosion.	b) Has the project incorporated a plan to prevent increases of flow from the project site?		
2020 LRDP EIR CBP USS-5.1. UC Berkeley would continue to implement a solid waste reduction and recycling program designed to reduce the total quantity of campus solid waste that is disposed of in landfills during implementation of the 2020 LRDP.	Has UC Berkeley continued to implement a solid waste reduction and recycling program to reduce the total quantity of campus solid waste that is disposed of in landfills during implementation of the 2020 LRDP?	PP-CS	O
2020 LRDP EIR CBP USS-5.2. In accordance with The Regents-adopted green building policy and the policies of the 2020 LRDP, the University would develop a method to quantify solid waste diversion. Contractors working for the University would be required under their contracts to report their solid waste diversion according to the University's waste management reporting requirements.	Has the University developed a method to quantify solid waste diversion?	PP-CS	O
	Does the project contract require the contractors working for the University to report their solid waste diversion according to the University's waste management reporting requirements?	PM	W and C
2020 LRDP EIR MM USS-5.2. Contractors on future UC Berkeley projects implemented under the 2020 LRDP EIR will be required to recycle or salvage at least 50% of construction, demolition, or land clearing waste. Calculations may be done by weight or volume but must be consistent throughout.	Has at least 50% of construction, demolition or land clearing waste associated with the project been recycled or salvaged?	PM	W and C

General Acronyms

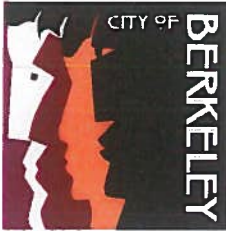
BAS – UCB Business & Administrative Services
CBP – Continuing Best Practices
CFM - Campus Fire Marshal
EH&S - UCB Environment Health and Safety
MM – Mitigation Measure
OEP – UCB Office of Emergency Preparedness
P&T - UC Parking & Transportation
PEP - UC Physical & Environmental Planning
PM - UCB Project Management
PP-CS - UCB Physical Plant—Campus Services
RSSP - Residential & Student Services Program
UCPD - UC Police Department

Monitoring Phases

P: Planning and Schematic Design
W: CDs and Bid
C: Construction
O: Post-Occupancy

APPENDIX A

PUBLIC COMMENTS IN RESPONSE TO THE NOTICE OF PREPARATION



Letter A 1

Landmarks Preservation Commission

March 7, 2019

Letter from Commission to UC regarding
Draft Supplemental Environmental Impact Report
For Upper Hearst Development for the Goldman School of Public Policy

The City of Berkeley Landmarks Preservation Commission appreciates the opportunity to comment on the Draft Supplemental Environmental Impact Report (DEIR) prepared for the Upper Hearst Development for the Goldman School of Public Policy.

The Commission's primary concern is the impact of the project on nearby city landmarks and other historic buildings. The SEIR notes that the project site is immediately adjacent to two listed city landmarks¹. It fails to note that a third listed city landmark² is across the street or that one block north of the project site is another designated city landmark³ and a cluster of houses by significant Berkeley architects, including Julia Morgan, Bernard Maybeck, and Lilian Bridgman. The Commission encourages the University to strengthen the historical analysis by further use of the extensive research resources of the Berkeley Architectural Heritage Association (BAHA), including its website BerkeleyHeritage.com which contains many essays on buildings and history related to this site and surrounding neighborhood.

A 1.1

The SEIR lists as a Project Objective to "Maintain the historic character and setting of the surrounding landmark buildings to the extent feasible." Unfortunately the project design as presented in the SEIR fails to make even a slight concession to its historic setting. The height, scale, massing, and exterior materials of the project will overpower and diminish its neighbors.

A 1.2

Portions of the adjacent residential neighborhood survived the 1923 Berkeley Fire, which destroyed almost all of the area north of the campus. This neighborhood retains some of the oldest houses in this part of the city. Three houses on Ridge Road, which face directly toward the project are among the survivors of the Fire. The Commission believes it is especially important that the project respect the scale of these and other buildings on Ridge Road and the transition to the neighborhood further north. To accomplish this the Commission strongly urges that the University select the Reduced Scale Alternative for the residential component of the project as described in the DEIR.

A 1.3

The Public Policy addition as proposed is too large in relation to the historic Beta Theta Pi fraternity building that serves as part of the GSPP site. The scope and scale of the academic building is not backed up by any analysis of the real needs of the school, which, at its current physical size, is already a leading institution. The new building should not loom hugely over the older building or partially block views of it from the public street. This could be addressed in part by scaling back the proposed addition both in height, and in width along the Hearst frontage. Reduced size would not only lower overall project costs but make the addition a better neighbor to its historic predecessors.

A 1.4

Finally the Commission is concerned with the articulation of the exterior of the project's residential component and the exterior materials selected. The plans shown in Figures 5 through 9 and the section shown in Figure 16 appear to represent a design consisting of a new three-story parking structure and an apartment building above it of five stories. The plan shown in Figure 4 and the renderings shown in Figure 18 appear to represent a different design incorporating the existing parking structure and an apartment building of between four and six stories above it. Confusingly all the plans appear to show a property line with a curved corner at La Loma and Hearst even though that intersection has now been reconfigured. If the existing parking structure is removed, the floor-plates no longer need to conform to the curved line and could extend into the space regained by the change in the configuration of the intersection. A redesign of this corner of the residential component might accommodate one or two additional apartments per floor. Thus the project height could be reduced at the north end adjacent to Ridge Road without reducing the overall number of units, even if the Reduced Scale Alternative were rejected.

A 1.5

A 1.6

The use of rectilinear forms and breaks in the façade, as implied by the plans in Figures 5 through 9 would facilitate use of exterior cladding materials which could be more in harmony with the neighborhood and with the existing Foothill Housing across the street. The curved white monolithic appearance of the project in the renderings of Figure 18 is inappropriate. The stained concrete of Sutardja Dai Hall on Hearst Avenue, opposite the Goldman School academic buildings, and the slate shingles of the Hargrove Music Library, on the opposite site of the campus, suggest contemporary alternatives to consider which would mitigate the impact of the very large project. Brick, or some fire resistant material replicating wood shingles, would also be options for exterior cladding consistent with the historic neighborhood. The Goldman School project offers the University the opportunity to meet its academic needs and to build much needed housing in a way that respects this very historic Berkeley's neighborhood and its architectural inheritance. We believe the façade design implied by the plans in Figures 5 through 9, together with the Reduced Scale Alternative for the housing portion of the project would best achieve these goals.

A 1.7

LPC Chairperson, Steven Finacom

¹ Cloyne Court, former Beta Theta Pi House

² Allenoke Manor, 1777 Ridge Road, City Landmark #113

³ Bentley House

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

TSU-JAE KING LIU
 DEAN AND ROY W. CARLSON .PROFESSOR OF ENGINEERING
 UNIVERSITY OF CALIFORNIA
 COLLEGE OF ENGINEERING
 320 McLAUGHLIN HALL # 1700
 BERKELEY, CA 94720-1700

TELEPHONE: (510) 642 5771
 FACSIMILE: (510) 642-9178
 email: tjklui@berkeley.edu

March 18, 2019

Raphael Breines, Senior Planner
 Physical & Environmental Planning
 University of California, Berkeley
 300 A&E Building, Berkeley, CA 94720-1382

Re: Upper Hearst Development for the Goldman School of Public Policy

Dear Raphael,

I write to you to express serious concerns regarding the plan to convert the Upper Hearst parking structure into two new buildings comprising academic space, housing and parking. Additional diligence is needed to fully understand and mitigate the negative impacts this construction project would have on the campus community, including the faculty and staff of the College of Engineering (CoE).

The Upper Hearst parking structure currently has a capacity of 390 parking spaces, 44 of which are stacked when attendants are available. All of these spaces would be eliminated during the two-year period of construction. During that time, members of the campus community who have regularly parked in the Upper Hearst parking structure will be directed to park instead at either the Foothill Lot (~100-125 spaces), the second level of the privately operated garage at Maxwell Family Field (~125 spaces), or the Clark Kerr campus (~100-125 spaces). After construction is completed, approximately 170 parking spaces will be provided; of those, 90 will be reserved for residents of the new housing. As a result, there will be a net loss of more than 300 spaces at the Upper Hearst site.

A 2.1

Below I summarize some of the issues with the current plan, posing questions to be responded to in the final draft of the Supplemental Environmental Impact Report (SEIR) that will be submitted to The Regents of the University of California (UC Regents) for consideration and approval.

Inconsistent communications regarding the nature of the project:

- The Upper Hearst development project originally was promoted as part of the campus's plan to address the need for more affordable student housing. Indeed, in a [March 13 Daily Cal article](#) covering the UC Board of Regents' Finance and Capital Strategies Committee meeting, it appears that the project is still understood as something that will provide new student housing. At that same meeting, the supporting documents for the project highlighted the need for affordable housing for students, but the project's target population has now expanded to include faculty, visiting scholars, graduate students and post-doctoral scholars with no guarantee that the rents will be affordable. ***What are the latest estimated rents for the 150 studios, 1-bedroom and 2-***

A 2.2

<p><i>bedroom units currently planned for this project?</i> If they are near market rates, this will not go over well with advocates for more affordable student housing.</p>	
<ul style="list-style-type: none"> If the expected occupants of the residential units are primarily populations other than students, this would represent a material change of plan that warrants an explanation. <i>When is the campus administration planning to inform the UC Regents and the public of this material change in housing plan and the rationale for it, including the latest financial analysis for the entire development project?</i> 	A 2.3
<ul style="list-style-type: none"> There is a campus Long Range Development Plan (LRDP) addendum that is attached to the Upper Hearst development project's draft Supplemental Environmental Impact Report (SEIR). This compromises the ability to evaluate the merits of the Upper Hearst development project independently. <i>With the LRDP addendum, is there an impact on future campus development projects if the Upper Hearst development project is delayed or not approved? Can the LRDP addendum be separated from consideration of the Upper Hearst development project?</i> 	A 2.4
<p><u>Financial risk to the university:</u></p>	
<ul style="list-style-type: none"> <i>Has the campus conducted a thorough market analysis for the housing?</i> In the past, the campus administration overestimated revenue to justify the renovation of the California Memorial Stadium. (Actual revenue from athletic ticket sales, particularly long-term season tickets, and other sources have come in far below projections.) Campus administrators should be careful to avoid further committing the campus to fiscally irresponsible plans. 	A 2.5
<ul style="list-style-type: none"> <i>Has the campus guaranteed a minimum level of occupancy and/or rental income to the developer? If the number of campus-affiliated renters falls below projections, or if revenue from rents falls below expectations, will the campus be obligated to cover the difference? If so, what is the campus's plan for doing so?</i> 	A 2.6
<ul style="list-style-type: none"> The campus traditionally charges \$25,000 for each parking space eliminated due to construction projects. <i>Is the Upper Hearst development project being assessed \$9.75 million for the loss of 390 parking spots during construction?</i> (This would help to partially cover the costs of mitigating the effects of the loss of parking at the Upper Hearst site.) <i>If not, why not?</i> 	A 2.7
<ul style="list-style-type: none"> <i>During the course of construction, will the construction workers (estimated to be over 200 in number) park at an off-campus site? Will their transit time to and from that site be counted as paid work time? Is that additional work time included in the project's cost estimate?</i> 	A 2.8
<ul style="list-style-type: none"> The campus community has weathered budget cuts for multiple years in a row, even as it has accommodated growth in student enrollment, resulting in higher average workload for the faculty and staff. A significant reduction in parking on campus will make life even more difficult for faculty and staff, so that recruitment and retention of outstanding faculty and staff – who are regularly targeted by our peer institutions as well as by the local DOE national labs and Bay Area companies – will become even more of a challenge. <i>Has the campus administration considered the financial cost of higher compensation packages for faculty and staff, in order to sustain UC Berkeley's tradition of excellence and access?</i> 	A 2.9
<p><u>Increased traffic congestion and carbon footprint:</u></p>	
<ul style="list-style-type: none"> Hunting for scarce parking spots already adds congestion to campus roads; this issue will be exacerbated if the total number of available parking spots on campus will be reduced by more than 300, as is currently planned. Increased usage of the Maxwell Field and Clark Kerr parking lots will add to the already significant congestion on Gayley Road, particularly during commute hours or while special events are taking place. Some faculty and staff may ultimately need to resort to ride-share services. Studies have shown that the proliferation of Lyft and Uber usage has increased traffic congestion. <i>Has a study been conducted to understand and mitigate the impact of increased traffic resulting from the Upper Hearst development project, including</i> 	A 2.10

likely congestion due to an increase in ride-share services around campus? Increased traffic congestion defeats any argument that this project will reduce carbon emissions.

- When conferences or special meetings are held at the Clark Kerr campus, the number of available parking spaces there will be dramatically diminished. **Will the campus halt the practice of reserving parking spaces for conference and special meeting attendees at the Clark Kerr campus to ensure that it is a reliable alternative location for parking?**
- Presently the entire UC Berkeley campus has only one electric vehicle (EV) charger, located in the Upper Hearst parking structure. **What is the campus's plan for installing new EV chargers?**

A 2.11

A 2.12

Detrimental impact on safety:

- Driving – and parking – is a necessity for many members of the Berkeley campus community, particularly those who have been forced to reside far away due to high housing costs in/near Berkeley. Those who live in areas not served well by BART or other forms of public transportation need to be able to park reasonably near (within easy walking distance) to their workplaces on campus. This is particularly important for parents who must manage childcare needs and for people who carpool. The Berkeley campus already is notorious for its dearth of parking options for those who work and study here. **Will an adequate number of viable parking alternatives for the campus community be established before commencing construction at the Upper Hearst site?**
- The measures presently being planned by the office of Parking & Transportation to mitigate the effects of a large reduction in the number of parking spaces on campus are problematic:
 - Of the alternatives to the Upper Hearst parking structure, the Foothill Lot (especially its southern portion) involves a greater change in elevation. Presently there is neither a sidewalk nor lighting along the south side of Cyclotron Road to ensure the safety of pedestrians walking to/from the Foothill Lot. This is clearly an issue for faculty and students who regularly work into the evening to conduct research and/or to teach or attend lab sections, and for staff who meet with student organizations and manage special events (student town-hall meetings, job fairs and info-sessions for companies who come to campus to recruit our students, etc.) after normal working hours. The Foothill Lot only can be accessed safely with a stairway, which is not a viable option for many with physical disabilities. **What is the plan for addressing these safety issues for users of the Foothill Lot?**
 - It should be noted that, nowadays, most of the 125 spaces at the Foothill Lot are filled by late morning; thus, this alternative parking location can address only roughly ten percent of the problem created by the elimination of parking at the Upper Hearst site.
- Notably, the Lower Hearst parking structure, which was not noted as an alternative in the project plans, is the closest lot to Upper Hearst. This lot fills up quickly, but it would likely be the first alternative people would attempt to use if the Upper Hearst parking structure were to be demolished.
- Parking at the Maxwell Field garage and the Clark Kerr campus would significantly increase the commute time for faculty, staff and students in the College of Engineering community, especially since the proposed operating frequency and hours of the new shuttle planned to transport people between the Clark Kerr campus and the northeast corner of campus are limited due to budgetary considerations. A standard-size shuttle would be too small during the hours of peak demand (7-9 AM and 4-6 PM). **How will the campus provide for safe and time-efficient transport from the Clark Kerr campus to the main campus, especially during the aforementioned peak commuting hours?** Also, it should be noted that students residing near the Clark Kerr campus will likely want to use the new shuttle service, leaving even fewer seats for faculty and staff.

A 2.13

A 2.14

A 2.15

A 2.16

Reduced operational productivity and effectiveness:

- Extra time spent each day getting to and from campus results in lost worker productivity. Realistically, people who presently park in the Upper Hearst parking structure will first look to park in the Lower Hearst parking garage before the Foothill Lot; they will also look to park in the Dwinelle Lot, Piedmont Lot, or Bancroft Lot before the Clark Kerr campus. (It would be easier for people who work on the south side of the campus compared with those who work on the north side to park at the Clark Kerr lots.)
- A very conservative estimate of an extra 20 minutes spent each day getting to and from the office, for 300 people, reduces time spent in the workplace by 25,000 hours each year. (Note that it is difficult for many people who must transport children to and from school/childcare to arrive on campus earlier and to leave the campus later to accommodate this extra time.) ***When is the campus administration planning to inform the entire campus community of the need for 390 additional people to park at the Foothill Lot, the Maxwell Field Garage and the Clark Kerr campus, as well as the new shuttle service, once construction at the Upper Hearst site commences?***
- Parking spaces at the Upper Hearst parking structure are regularly reserved by units including the Goldman School and the College of Engineering for special guests (e.g., VIP speakers and donors) when they visit the Berkeley campus. This is necessary to support ongoing fundraising efforts. ***How many of the new parking stalls in the newly constructed parking will be reserved for the disabled, the Goldman School, the College of Engineering, EECS Department, and other academic units and research institutes? (Will the number of reserved stalls be the same as the current number of reserved stalls in the Upper Hearst parking structure today?) And what is the plan for reserved stalls during the construction period?***

A 2.17

A 2.18

A 2.19

I strongly believe that it is in the campus's best interest to delay the Upper Hearst development project until adequate solutions to the aforementioned issues are developed and implemented.

Sincerely,



Tsu-Jae King Liu
Dean and Roy W. Carlson Professor of Engineering

CC: Marc Fisher, Vice Chancellor of Administration
Rosemarie Rae, Vice Chancellor of Finance
Campus Planning Committee

March 18, 2019

Raphael Breines, Senior Planner
Physical and Environmental Planning
University of California, Berkeley
300 A&E Building
Berkeley, CA 94720-1382

Re: Notice of Availability of a Draft Supplemental Environmental Impact Report – Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan, Berkeley

Dear Mr. Breines:

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Notice of Availability of a Draft Supplemental Environmental Impact Report (EIR) for the Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan (project) for the University of California, Berkeley (U.C. Berkeley) located in the City of Berkeley. EBMUD commented on the Notice of Preparation of a Draft EIR for the project on September 7, 2018. EBMUD's original comments (see enclosure) still apply regarding Water Service, Wastewater Service and Water Conservation. EBMUD has the following comments.

GENERAL

Under the Utilities and Service Systems section, within the Setting subsection, the EIR states that, "The Project site would be served from EBMUD's Santa Barbara Regulated Pressure Zone (Maggiore 2018)." While this is correct, the project site may also be served by the Summit Pressure Zone as stated in our previous response letter.

A 3.1

EBMUD's La Loma Regulator is located directly adjacent to the proposed project along the western sidewalk of La Loma Avenue, approximately 50 feet north of Hearst Avenue. La Loma Regulator supplies approximately 1,400 services. The integrity of this regulator needs to be maintained at all times. Any proposed construction activity that affects this regulator would be subject to the terms and conditions determined by EBMUD, including relocation of the facility at the project sponsor's expense

A 3.2

WATER RECYCLING

EBMUD's Policy 9.05 requires that customers use non-potable water, including recycled water, for non-domestic purposes when it is of adequate quality and quantity, available at reasonable

cost, not detrimental to public health and not injurious to plant, fish and wildlife to offset demand on EBMUD's limited potable water supply. Appropriate recycled water uses could include landscape irrigation, commercial and industrial process uses, toilet and urinal flushing in non-residential buildings and other applications.

The proposed project has been identified in the East Bayshore Recycled Water Project Water Quality Improvements Study as a potential customer to meet the long-term recycled water goal of 2.3 MGD. Currently, there is not a definite timeframe when the recycled water supply will reach the area; however, EBMUD is actively looking at using its recycled water for cooling towers for new developments. There was also discussion with U.C. Berkeley to potentially implement an on-site satellite recycled water treatment facility. As such, it is recommended that a parallel piping system for recycled water be installed and capped at this time for potential cooling tower supply to avoid significant costs to retrofit in the future.

A 3.3

EBMUD recommends that U.C. Berkeley and its developers continue to coordinate and consult with EBMUD regarding providing recycled water for appropriate non-potable purposes as they plan and implement this project.

A 3.4

If you have any questions concerning this response, please contact Timothy R. McGowan, Senior Civil Engineer, Major Facilities Planning Section at (510) 287-1981.

Sincerely,



David J. Rehnstrom
Manager of Water Distribution Planning

DJR:CC:dks
sb19_035.doc

Enclosures: Letter to U.C. Berkeley from EBMUD dated September 7, 2018
Letter to U.C. Berkeley from EBMUD dated January 29, 2004

September 7, 2018

Raphael Breines, Senior Planner
Physical & Environmental Planning
University of California, Berkeley
300 A&E Building
Berkeley, CA 94720-1382

Re: Notice of Preparation of a Draft Supplemental Environmental Impact Report – Upper
Hearst Development for the Goldman School of Public Policy and Minor Amendment to
the 2020 Long Range Development Plan, Berkeley

Dear Mr. Breines:

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Notice of Preparation of a Draft Supplemental Environmental Impact Report for the Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan (Project) for the University of California, Berkeley (U.C. Berkeley) located in the City of Berkeley. EBMUD has the following comments.

WATER SERVICE

On January 29, 2004, EBMUD provided a written response to U.C. Berkeley for a Water Supply Assessment (WSA) for the U.C. Berkeley 2020 Long Range Development Plan which is attached for your reference. If the proposed Project exceeds the water use and land uses in the approved 2020 Long Range Development Plan WSA, a revised WSA pursuant to Section 15155 of the California Environmental Quality Act Guidelines and Section 10910-10915 of the California Water Code may be required. Please submit a written request to EBMUD to review the Project changes to determine if a revised WSA is required. Preparation of the revised WSA will require U.C. Berkeley to submit data and estimates of future water demands for the Project area to EBMUD. Please be aware that the revised WSA can take up to 90 days to complete from the day the request was received.

EBMUD's Santa Barbara Regulator and Summit Pressure Zones, with service elevation ranges of 400 to 500 feet and 500 to 700 feet, respectively, will serve the proposed Project. Effective January 1, 2018, water service for new multi-unit structures shall be individually metered or sub-metered in compliance with State Senate Bill 7 (SB-7). SB-7 encourages conservation of water in multi-family residential and mixed-use multi-family and commercial buildings through metering infrastructure for each dwelling unit, including appropriate water billing safeguards for both tenants and landlords. EBMUD water services shall be conditioned for all development projects that are subject to SB-7 requirements and will be released only after the Project sponsor

has satisfied all requirements and provided evidence of conformance with SB-7. In addition, structures on a single parcel require separate water services. When the development plans are finalized, U.C. Berkeley should contact EBMUD's New Business Office and request a water service estimate to determine costs and conditions for providing water service to the proposed Project. Engineering and installation of water services require substantial lead time, which should be provided for in U.C. Berkeley's development schedule.

WASTEWATER SERVICE

EBMUD's Main Wastewater Treatment Plant (MWWTP) and interceptor system are anticipated to have adequate dry weather capacity to accommodate the proposed wastewater flows from this Project and to treat such flows provided that the wastewater generated by the Project meets the requirements of the EBMUD Wastewater Control Ordinance. However, wet weather flows are a concern. The East Bay regional wastewater collection system experiences exceptionally high peak flows during storms due to excessive infiltration and inflow (I/I) that enters the system through cracks and misconnections in both public and private sewer lines. EBMUD has historically operated three Wet Weather Facilities (WWFs) to provide primary treatment and disinfection for peak wet weather flows that exceed the treatment capacity of the MWWTP. Due to reinterpretation of applicable law, EBMUD's National Pollutant Discharge Elimination System (NPDES) permit now prohibits discharges from EBMUD's WWFs. Additionally, the seven wastewater collection system agencies that discharge to the EBMUD wastewater interceptor system ("Satellite Agencies") hold NPDES permits that prohibit them from causing or contributing to WWF discharges. These NPDES permits have removed the regulatory coverage the East Bay wastewater agencies once relied upon to manage peak wet weather flows.

A federal consent decree, negotiated among EBMUD, the Satellite Agencies, the Environmental Protection Agency (EPA), the State Water Resources Control Board (SWRCB), and the Regional Water Quality Control Board (RWQCB), requires EBMUD and the Satellite Agencies to eliminate WWF discharges by 2036. To meet this requirement, actions will need to be taken over time to reduce I/I in the system. The consent decree requires EBMUD to continue implementation of its Regional Private Sewer Lateral Ordinance (www.eastbaypsl.com), construct various improvements to its interceptor system, and identify key areas of inflow and rapid infiltration over a 22-year period. Over the same time period, the consent decree requires the Satellite Agencies to perform I/I reduction work including sewer main rehabilitation and elimination of inflow sources. EBMUD and the Satellite Agencies must jointly demonstrate at specified intervals that this work has resulted in a sufficient, pre-determined level of reduction in WWF discharges. If sufficient I/I reductions are not achieved, additional investment into the region's wastewater infrastructure would be required, which may result in significant financial implications for East Bay residents.

To ensure that the proposed Project contributes to these legally required I/I reductions, U.C. Berkeley should comply with EBMUD's Regional Private Sewer Lateral Ordinance. Additionally, it would be prudent for U.C. Berkeley to require the following mitigation measures for the proposed Project: (1) replace or rehabilitate any existing sanitary sewer collection systems, including sewer lateral lines to ensure that such systems and lines are free from defects

or, alternatively, disconnected from the sanitary sewer system, and (2) ensure any new wastewater collection systems, including sewer lateral lines, for the Project are constructed to prevent I/I to the maximum extent feasible while meeting all requirements contained in the Regional Private Sewer Lateral Ordinance and applicable municipal codes or Satellite Agency ordinances.

WATER CONSERVATION

The proposed Project presents an opportunity to incorporate water conservation measures. EBMUD requests that U.C. Berkeley comply with Assembly Bill 325, "Model Water Efficient Landscape Ordinance," (Division 2, Title 23, California Code of Regulations, Chapter 2.7, Sections 490 through 495) for the proposed Project. U.C. Berkeley should be aware that Section 31 of EBMUD's Water Service Regulations requires that water service shall not be furnished for new or expanded service unless all the applicable water-efficiency measures described in the regulation are installed at the Project sponsor's expense.

If you have any questions concerning this response, please contact Timothy R. McGowan, Senior Civil Engineer, Major Facilities Planning Section at (510) 287-1981.

Sincerely,

A handwritten signature in dark ink, appearing to read "David J. Rehnstrom", with the word "FOR" written in capital letters to the right of the signature.

David J. Rehnstrom
Manager of Water Distribution Planning

DJR:KKN:dks
sb18_157.doc

Attachment: Letter to U.C. Berkeley from EBMUD dated January 29, 2004

January 29, 2004

Jennifer Lawrence, Senior Planner
Environmental and Long Range Planning Office
University of California, Berkeley
300 A & E Building, #1382
Berkeley, CA 94607-4249

Dear Ms. Lawrence:

Re: Water Supply Assessment – University of California, Berkeley 2020 Long Range
Development Plan

This letter responds to your request of October 22, 2003 for water agency consultation concerning the University of California, Berkeley (U.C. Berkeley) 2020 Long Range Development Plan (Enclosure 1). The East Bay Municipal Utility District (EBMUD) appreciates the opportunity to provide this response.

Pursuant to Sections 10910-10915 (SB-610) of the California Water Code, the project meets the threshold requirement for an assessment of water supply availability based on the amount of water this project would require, which would be greater than the amount of water required by a 500 dwelling unit project. Because this project is not a residential subdivision, Government Code Section 66473.7 (SB-221) does not apply.

Please note that this assessment addresses the issue of water supply only and is not a guarantee of service, and future water service is subject to rates and regulations in effect at the time.

Project Demand

The water demands for the U.C. Berkeley 2020 Long Range Development Plan project area are accounted for in EBMUD's water demand projections as published in EBMUD's 2000 Urban Water Management Plan (UWMP/Enclosure 2). EBMUD's water demand projections account for anticipated future water demands within EBMUD's service boundaries and for variations in demand-attributed changes in development patterns. The current water demand for the existing land uses in the U.C. Berkeley 2020 Long Range Development Plan project area is about 100,000 gallons per day (gpd). The projected demand, based on the projected water consumption by EBMUD for the project area, is estimated to be about 400,000 gpd, which is consistent with EBMUD's demand projections which indicate densification of these types of land uses.

Project Area

The U.C. Berkeley 2020 Long Range Development Plan project area is located in Berkeley and Oakland. The project area consists of approximately 1,400 acres that include the intensively developed Campus Park, the Hill Campus, and areas adjacent to the Campus Park. The Lawrence Berkeley National Laboratory is under Federal jurisdiction and therefore outside the scope of the U.C. Berkeley 2020 Long Range Development Plan.

The project under consideration includes the U.C. Berkeley 2020 Long Range Development Plan (program level analysis) and the Chang-Lin Tien Center for East Asian Studies (project level analysis). The 2020 Long Range Development Plan includes development of residential, classroom and laboratory space. Residential development will consist of 2,500 student housing bed units and 200 faculty/staff units. Approximately 1,540,000 square feet of general campus space and 660,000 square feet of laboratory space will also be constructed under the 2020 Long Range Development Plan. The Tien Center consists of two buildings totaling 103,500 square feet.

EBMUD Water Demand Projections

The water consumption of EBMUD customers has remained relatively level in recent years in spite of population and account growth. Between 1987 and the present, consumption has ranged from a high of approximately 220 million gallons per day (mgd) in 1987 to a low of 170 mgd in 1989. Based on extensive forecasting in EBMUD's Water Supply Management Program (WSMP) and recent land use based demand forecasting, the WSMP forecast 2020 water demand of 277 mgd can be reduced to 229 mgd with successful water recycling and conservation programs that are in place. The U.C. Berkeley 2020 Long Range Development Plan will not change the EBMUD 2020 demand projection.

EBMUD Water Supply and Water Rights

EBMUD has water rights and facilities to divert up to a maximum of 325 mgd from the Mokelumne River, subject to the availability of Mokelumne River runoff and the prior water rights of other users. EBMUD's position in the hierarchy of Mokelumne River water users is determined by a variety of agreements between Mokelumne River water right holders, the appropriative water rights permits and licenses that have been issued by the State, pre-1914 rights, and riparian rights. Conditions that restrict EBMUD's ability to use its 325 mgd entitlement include:

- Upstream water use by prior right holders.
- Downstream water use by riparian and senior appropriators and other downstream obligations, including protection of public trust resources.

- Drought, or less than normal rainfall for more than a year.
- Emergency outage.

During periods of drought, runoff from the Mokelumne River is insufficient to supply the 325 mgd entitlement. EBMUD studies indicate that, with its current water supply and the water demands expected in 2020, deficiencies in supply of up to 67 percent could occur during droughts.

EBMUD UWMP

The UWMP, adopted by the Board of Directors in Resolution No. 33242-01, includes planning level analyses at the County- and EBMUD-wide levels for existing and projected water demand. A summary of EBMUD's demand and supply projections in five-year increments is provided in a table (Enclosure 3) from the UWMP. The data reflects the latest actual and forecast values.

EBMUD's evaluation of water supply availability accounts for the diversions of both upstream and downstream water right holders and fishery releases. Fishery releases are based on the requirements of a 1998 Joint Settlement Agreement (JSA) between EBMUD and State and Federal wildlife agencies. The JSA requires EBMUD to make minimum flow releases from its reservoirs to the lower Mokelumne River to benefit the fishery. As this water is released downriver, it is, therefore, not available for use by EBMUD's customers.

The available supply shown in the table (Enclosure 3) in years 1, 2 and 3 of a multiple-year drought was determined by EBMUD's hydrologic model with the following assumptions:

- EBMUD Drought Planning Sequence is used for 1976, 1977, and 1978.
- Total system storage is depleted by the end of the third year of the drought.
- The diversions by Amador and Calaveras Counties upstream of Pardee Reservoir increase over time.
- Releases are made to meet the requirements of senior downstream water right holders and fishery releases are made according to the JSA.

As discussed under the Drought Management Program section in Chapter 3 of the UWMP, EBMUD's system storage generally allows it to continue serving its customers during dry-year events. EBMUD imposes rationing based on the projected storage at the end of September. By imposing rationing in the first dry year of potential drought, EBMUD attempts to minimize rationing in subsequent years if a drought persists while continuing to meet its current and subsequent-year fishery flow release requirements and obligations to downstream agencies. Table 3-1 in the UWMP summarizes the guidelines for consumer water reduction goals, based on system storage.

In the table (Enclosure 3), "Single Dry" year (or Year 1 of "Multiple Dry Years") is determined to be a year that EBMUD would implement Drought Management Program elements at the "moderate" stage with the goal of achieving between 0 to 15 percent reduction in customer demand. Year 2 of Multiple Dry Years is determined to be a year that EBMUD would implement Drought Management Program elements at the "severe" stage with the goal of achieving between 15 to 25 percent reduction in customer demand. In Year 3 of the multiple-year drought, deficiencies from about 48 percent in year 2005 to about 67 percent in year 2020 are forecast to occur. Therefore, a supplemental supply is needed, which is defined by EBMUD as the additional amount of water necessary to limit customer deficiency to 25 percent in a multiple-year drought while continuing to meet the requirements of senior downstream water right holders and the provisions of the 1998 JSA.

Supplemental Water Supply and Demand Management

The goals of meeting projected water needs and increased water reliability rely on three components: supplemental supply, water conservation, and recycled water.

Chapter 2 of the UWMP describes EBMUD's supplemental water supply project alternatives to meet its long-term water demand. To address the need for a supplemental water supply during droughts, EBMUD signed a contract in 1970 with the Federal government for a supplemental supply from the Central Valley Project (CVP). In 2001, EBMUD certified the environmental documentation amending its CVP contract 14-06-200-5183A, reducing EBMUD's contract from 150,000 acre-feet (AF)/year to an annual entitlement not to exceed 133,000 AF. In 2002, EBMUD signed a Memorandum of Agreement with the City of Sacramento, the County of Sacramento, and the U.S. Bureau of Reclamation to study a joint regional water project on the Sacramento River near Freeport. The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) of the Freeport Regional Water Project identifies several regulatory permits and approvals required for the implementation of the project alternatives. These are listed in Table 2-6 of the Freeport Regional Water Project Draft EIR/EIS, July 2003.

Chapter 2 of the UWMP also describes other supplemental water projects, including the development of groundwater storage within EBMUD's service area. EBMUD is studying the environmental impacts of these proposed projects. Specific capital outlay and financing information for these projects are included in EBMUD's FY02-03 Budget and Five-Year Plan. The Freeport project would also allow for a future groundwater conjunctive use component and, along with the proposed local groundwater projects, emergency interties, and planned water recycling and conservation efforts, would ensure a reliable water supply to meet projected demands for current and future EBMUD customers within the current service area. Without a supplemental water supply source, continued conservation efforts and further use of recycled water, deficiencies in supply are projected as noted above.

The U.C. Berkeley 2020 Long Range Development Plan presents an opportunity to incorporate many water conservation measures. U.C. Berkeley should include in its conditions of approval for the implementation of the 2020 Long Range Development Plan that the project complies with Division 2, Title 231 California Code of Regulations, Chapter 2.7, Sections 490 through 495 (AB325), and with EBMUD water service regulations in force at the time the application is made. EBMUD staff would appreciate the opportunity to meet with U.C. Berkeley's staff to discuss water conservation programs and best management practices applicable to the project area. A key objective of this discussion will be to explore timely opportunities to expand conservation via early consideration of EBMUD's conservation programs and best management practices applicable to the project.

EBMUD's Policy 73 requires "...that customers...use non-potable water for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health and not injurious to plant life, fish and wildlife" to offset demand on EBMUD's limited potable water supply. U.C. Berkeley has been identified as a potential customer for EBMUD's Satellite Recycled Water Treatment Facility Project. A study is currently underway to evaluate the feasibility of constructing a small satellite recycled water treatment facility to serve a large customer within the EBMUD wastewater service area, and the U.C. Berkeley campus is one of the large customers under consideration. EBMUD staff will continue to work with U.C. Berkeley as the study proceeds and will coordinate with U.C. Berkeley regarding the installation of dual plumbing systems where feasible.

The project sponsor should contact David J. Rehnstrom, Senior Civil Engineer, at (510) 287-1365 for further information.

Sincerely,



WILLIAM R. KIRKPATRICK
Manager of Water Distribution Planning Division

WRK:GAA:rc
sb04_001b.doc

- Enclosures:
1. Letter of Request for Water Supply Assessment dated October 23, 2003
 2. EBMUD's 2000 Urban Water Management Plan Area
 3. EBMUD's Projected Demand and Available Supply Table

cc: Board of Directors w/o Enclosure 2

UNIVERSITY OF CALIFORNIA, BERKELEY

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SANTA BARBARA • SANTA CRUZ

CAPITAL PROJECTS
PHYSICAL AND ENVIRONMENTAL PLANNING
300 A & E BUILDING, # 1382

BERKELEY, CALIFORNIA 94720-1382

October 22, 2003

William R. Kirkpatrick
Manager of Water Distribution Planning
East Bay Municipal Utility District
375 Eleventh Street
Oakland, CA 94607-4249

WATER DISTRIBUTION

OCT 23 2003

PLANNING DIVISION

SUBJECT: Request for a Water Supply Assessment for the 2020 Long Range Development Plan pursuant to Section 10910 of the state Water Code and Section 15083.5, California Environmental Quality Act Guidelines

Dear Mr. Kirkpatrick:

This letter is to formally request that East Bay Municipal Utilities District undertake a water supply assessment (WSA) for UC Berkeley's proposed 2020 Long Range Development Plan (LRDP) pursuant to Section 10910 of the state Water Code and Section 15083.5 of the California Environmental Quality Act Guidelines using information on projected water demand provided in the attachment.

A Notice of Preparation (NOP) for this project was circulated for 30 days beginning August 29, 2003 (ref. *Initial Study Checklist and Notice of Preparation for UC Berkeley 2020 Long Range Development Plan and Chang-Lin Tien Center for East Asian Studies*, dated August 29, 2003). The University received a comment letter from EBMUD dated September 29, 2003 in response to the NOP which states that there was not enough information to assess future water demand. It is our hope that the supplemental information provided with this letter will make it possible to prepare a WSA on behalf of the 2020 LRDP.


As described in the NOP, the new development proposed in the 2020 LRDP – to be analyzed in the EIR – is a maximum of:

- 2,200,000 gross square feet (gsf) of campus academic and support space (including 660,000 gsf identified specifically as laboratory space)
- 2,500 student housing beds
- 200 units of staff/faculty housing

A maximum annual water demand projection was calculated for the 2020 LRDP by applying historical campus water usage to the proposed additional square footage and housing. The campus estimates an additional water demand of 404,000 gpd associated with the plan. Please refer to the attached worksheet for calculations and details.

Please call Billi Romain at (510) 643-4404 if there is any additional information you need to complete the Water Supply Assessment for the 2020 LRDP.

Sincerely,


Jennifer Lawrence, Principal Planner
Environmental and Long Range Planning

PROJECTED DEMAND AND AVAILABLE SUPPLY
EAST BAY MUNICIPAL UTILITY DISTRICT
(million gallons per day - mgd)

	2000	2005	2010	2015	2020
Customer Demand ¹	230	242	257	267	277
Adjusted for Conservation ²	(8)	(14)	(20)	(27)	(34)
Adjusted for Recycled Water ³	(6)	(9)	(11)	(12)	(14)
Planning Level of Demand	216	219	226	228	229
Available Supply & Need for Supplemental Supply					
Normal Year	>216	>219	>226	>228	>229
<i>Supplemental Supply Need</i>	0	0	0	0	0
Single Dry Year (Multiple Dry Years - Year 1) Moderate Stage (approximately 7% deficiency) ⁴	200	203	210	212	213
<i>Supplemental Supply Need</i>	0	0	0	0	0
Multiple Dry Years - Year 2 Severe Stage (approximately 25% deficiency) ⁴	162	164	169	171	172
<i>Supplemental Supply Need</i>	0	0	0	0	0
Multiple Dry Years - Year 3					
Available Supply	125	114	95	84	77
Deficiency	42%	48%	58%	63%	67%
<i>Supplemental Supply Need⁵ (to limit deficiency to 25%)</i>	87	102	128	142	154

1. Demand taken from the 2000 Demand Study.
2. Conservation water savings goals from the WCMP 1999 Annual Report, 2 mgd in 1999 and 34 mgd for year 2020, linearly interpolated into five-year increments.
3. Chapter 5 of UWMP.
Note: Conservation and Reclamation savings reported are those attributed to programs which are a part of the 1993 WSMP. Reference Chapter 6 of UWMP.
4. Drought conditions per Table 3-1, UWMP.
5. The supplemental supply need is calculated from modeling studies and is the amount of water needed to limit customer deficiency to 25 percent and to implement all provisions of the 1998 Joint Settlement Agreement.



Gavin Newsom
Governor

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit



Kate Gordon
Director

Letter A 4

Memorandum

Date: March 19, 2019
To: All Reviewing Agencies
From: Scott Morgan, Director
Re: SCH # 2003082131
**Upper Hearst Development for the Goldman School of Public Policy and Minor
Amendment to the 2020 LRDP**

Pursuant to the attached letter, the Lead Agency has *extended* the review period for the above referenced project to **April 12, 2019** to accommodate the review process. All other project information remains the same.

A 4.1

cc: Raphael Breines
University of California, Berkeley
300 A&E Building
Berkeley, CA 94720

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL 1-916-445-0613 state.clearinghouse@opr.ca.gov www.opr.ca.gov



PHYSICAL & ENVIRONMENTAL PLANNING
A & E BUILDING, # 1382

BERKELEY, CALIFORNIA 94720-1382

**NOTICE OF EXTENDED PUBLIC COMMENT PERIOD OF A
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT**

Project Title: Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan

Lead Agency: The Regents of the University of California

Project Sponsor: University of California, Berkeley

Project Location: University of California, Berkeley: adjacent to 2607 Hearst Avenue at La Loma Avenue, Berkeley, California 94720; Assessor's Parcel Number 58-2201-9-1

County: Alameda County, California

Program EIR: UC Berkeley 2020 Long Range Development Plan EIR, certified by The Regents January 2005, State Clearinghouse No. 2003082131; as updated by Amendment #1 to the 2020 LRDP to address Climate Change and accompanying Addendum #5 to the 2020 LRDP EIR.

In accordance with the California Environmental Quality Act (CEQA), the University of California has completed a Draft Supplemental Environmental Impact Report (Draft SEIR) addressing the potential environmental impacts associated with the proposed development of two buildings located on the UC Berkeley campus. This notice is to inform interested agencies and the public of the availability of the Draft SEIR and the start and end dates of the review period, within which comments on the Draft SEIR can be submitted to UC Berkeley.

Project Location and Description: The project site is an approximately 44,900-square-foot (just over one acre) portion of a University owned property on the northwest corner of La Loma Avenue and Hearst Avenue, immediately west of 2607 Hearst Avenue across from the northeastern region of the UC Berkeley Campus Park. The site is bordered on the north by Ridge Road and the Cloyne Court Student Cooperative; on the east by La Loma Avenue; on the south by Hearst Avenue; and on the west by the Goldman School of Public Policy and the Cloyne Court Student Cooperative. The project site is located within the area of campus designated in the 2020 LRDP as the "City Environs," and within the City Environs' Adjacent Blocks North subarea.

The project comprises two separate buildings – an academic building and a residential building on top of a rebuilt parking structure – that would be built concurrently by the project developer. The residential building would be up to six-stories constructed on top of a three-story partially subterranean parking structure where the Upper Hearst parking structure and adjacent at-grade Ridge parking lot are now located on La Loma Avenue between Hearst Avenue and Ridge Road. The residential component would consist of up to 150 residential units in a mixture of studio and one- and two-bedroom apartments for campus. The project would reduce the total number of parking spaces on-site from 346 to approximately 175. The building, including the residential units and parking, would be approximately 220,000 gross square feet.

A separate academic building would be constructed immediately east of the existing GSPP building located at 2607 Hearst Avenue. The approximately 37,000 gross square feet of office, classroom, and event space in the academic building would serve several GSPP programs. The academic building would be four stories in height over one subterranean level. The fourth level would provide access to a rooftop terrace and include an event space with a seating capacity of 300 that could accommodate up to 450 people at maximum capacity.

Notice of Extended Public Comment Period: UC Berkeley Draft Supplemental EIR to the 2020 LRDP

Environmental Review and Impacts of the Project: UC Berkeley has prepared a Draft SEIR, tiered from its 2020 LRDP EIR to evaluate the environmental effects of the proposed project. UC Berkeley has been approving development projects based upon environmental documents that tier off the 2020 LRDP EIR approved in 2005. The campus population has now increased beyond 2020 LRDP projections that were analyzed in the 2020 LRDP EIR. The Draft SEIR analyzes the impacts of the Upper Hearst Development project and any change in environmental impacts from increased enrollment that has led to a new baseline for the overall campus population to those identified in the 2020 LRDP EIR. The preliminary conclusions of the Draft SEIR indicate that the proposed project would result in new significant and unavoidable impacts that were not identified in the 2020 LRDP EIR in aesthetics and land use compatibility.

Public Review and Document Availability: The Draft SEIR will be circulated beyond the 45-day review and comment period by agencies and the public. The comment period began on February 20, 2019 and was scheduled to end on April 8, 2019. The comment period has been extended and will now end on April 12, 2019.

Written responses to the Draft SEIR must be received by 5:00 PM on Friday, April 12, 2019. A public hearing to receive oral comments was held on the UC Berkeley campus the evening of Tuesday, March 12, 2019. **A second public hearing will be held on the UC Berkeley campus the evening of Thursday, March 21, 2019. The second public hearing will be held from 6:30 p.m. to 8 p.m. at University Hall, Room 150 at 2199 Addison Street.**

UC Berkeley will prepare a Final SEIR that responds to comments received during the comment period. The Final SEIR, along with a mitigation monitoring and reporting program, will then be submitted to The Regents of the University of California for consideration and approval, anticipated in May 2019.

Links to electronic versions of this Notice of Extended Public Comment Period and Draft SEIR are available on-line on the UC Berkeley Capital Strategies website at: <https://capitalstrategies.berkeley.edu/resources-notices/public-notices>

Draft SEIR hard copies are also available for review in the following locations:

Berkeley Main Library
Reference Desk
2090 Kittredge Street
Berkeley, CA 94704

DOE Main Library
Reference Desk
South Hall Road
Berkeley, CA 94704

A&E Building
Physical & Environmental Planning
Berkeley, CA 94720
Call 510-643-7384 to arrange a visit

Opportunities for Commenting: UC Berkeley invites comments on Draft SEIR. **Please send written comments on the Draft SEIR by April 12, 2019,** to be considered in the Final SEIR. Comments should be addressed to:

Raphael Breines, Senior Planner
Physical & Environmental Planning
University of California, Berkeley
300 A&E Building, Berkeley, CA 94720-1382

You may also send written comments via email to: planning@berkeley.edu. Please include a subject line indicating Public Comments: Upper Hearst Development Project.

In addition, comments may be presented orally and in writing at the second public hearing to be held on Thursday, March 21, 2019, beginning at 6:30 PM at the following address:

University Hall, Room 150
2199 Addison Street
Berkeley, CA 94720

UC Berkeley appreciates your interest in this project and looks forward to your involvement with the environmental review process.

Governor's Office of Planning & Research

MAR 18 2019

Notice of Extended Public Comment Period: UC Berkeley Draft Supplemental EIR to the 2020 LRDP

STATE CLEARINGHOUSE

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
 For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2003082131

Project Title: Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 LRDP

Lead Agency: University of California, Berkeley

Contact Person: Raphael Breines

Mailing Address: 300 A&E Building, UC Berkeley

Phone: (510) 642-6796

City: Berkeley

Zip: 94720

County: Alameda

Project Location: County: Alameda

City/Nearest Community: Berkeley

Cross Streets: Hearst, Le Roy and La Loma Avenues

Zip Code: 94720

Longitude/Latitude (degrees, minutes and seconds): 37 ° 52 ' 32.2 " N / 122 ° 15 ' 26.9 " W Total Acres: 1+

Assessor's Parcel No.: 58-2201-9-1

Section: Twp.: Range: Base:

Within 2 Miles: State Hwy #: SR 24, SR 13, I 580

Waterways: San Francisco Bay

Airports: N/A

Railways: N/A

Schools: Multiple

Document Type:

CEQA: ☐ NOP☐ Early Cons☐ Neg Dec☐ Mit Neg Dec☒ Draft EIR☐ Supplement/Subsequent EIR

(Prior SCH No.)

Other:

NEPA: ☐ NOI☐ EA☐ Draft EIS☐ FONSIOther: ☐ Joint Document☐ Final Document

Other:

Local Action Type:

☐ General Plan Update☐ General Plan Amendment☐ General Plan Element☐ Community Plan☐ Specific Plan☐ Master Plan☐ Planned Unit Development☒ Site Plan☐ Rezone☐ Use Permit☐ Land Division (Subdivision, etc.)☐ Annexation☐ Redevelopment☐ Coastal Permit☒ Other: Amendment

Development Type:

☒ Residential: Units 150

Acres 0.5

☐ Office: Sq.ft.

Acres

Employees

☐ Commercial: Sq.ft.

Acres

Employees

☐ Industrial: Sq.ft.

Acres

Employees

☒ Educational: 37,000 sq. ft. academic building☐ Recreational:☐ Water Facilities: Type

MGD

☐ Transportation: Type☐ Mining: Mineral☐ Power: Type☐ Waste Treatment: Type☐ Hazardous Waste: Type

Other:

Project Issues Discussed in Document:

☒ Aesthetic/Visual☐ Agricultural Land☒ Air Quality☒ Archeological/Historical☒ Biological Resources☐ Coastal Zone☒ Drainage/Absorption☐ Economic/Jobs☐ Fiscal☒ Flood Plain/Flooding☒ Forest Land/Fire Hazard☒ Geologic/Seismic☐ Minerals☒ Noise☒ Population/Housing Balance☒ Public Services/Facilities☒ Recreation/Parks☒ Schools/Universities☐ Septic Systems☐ Sewer Capacity☒ Soil Erosion/Compaction/Grading☒ Solid Waste☒ Toxic/Hazardous☒ Traffic/Circulation☒ Vegetation☒ Water Quality☒ Water Supply/Groundwater☒ Wetland/Riparian☒ Growth Inducement☒ Land Use☒ Cumulative Effects

Other:

Present Land Use/Zoning/General Plan Designation:

R-3H

Project Description: (please use a separate page if necessary)

The Upper Hearst Development for the Goldman School of Public Policy (GSPP) project is located on the northeast edge of the UC Berkeley Campus Park and includes two components - academic and residential - to be undertaken simultaneously by a project developer. The academic component involves constructing an approximately 37,000 square foot building immediately east of the existing GSPP building located at 2607 Hearst Avenue. The residential building would be up to six stories constructed on top of a three-story mostly subterranean parking structure and consist of up to 150 residential units in a mixture of studio and one- and two-bedroom apartments.

State Clearinghouse Contact:

(916) 445-0613

State Review Began:

2-20-2019

SCH COMPLIANCE

4-16-2019

12

NRK: FPL

Please note State Clearinghouse Number (SCH#) on all Comments

SCH#:

2003082131

Please forward late comments directly to the Lead Agency

AQMD/APCD 2

(Resources: 2, 123)

Project Sent to the following State Agencies

☒ Resources☐ Boating & Waterways☐ Central Valley Flood Prot.☐ Coastal Comm☐ Colorado Rvr Bd☐ Conservation☒ CDFW # 3☐ Cal Fire☒ Historic Preservation☒ Parks & Rec☒ Bay Cons & Dev Comm.☐ DWR

Cal EPA

☐ ARB: Airport & Freight☒ ARB: Transportation Projects☐ ARB: Major Industrial/Energy☐ Resources, Recycl. & Recovery☒ SWRCB: Div. of Drinking Water☐ SWRCB: Div. Drinking Wtr #☐ SWRCB: Div. Financial Assist.☐ SWRCB: Wtr Quality☐ SWRCB: Wtr Rights☒ Reg. WQCB # 2☒ Toxic Sub Ctrl-CTC☐ Yth/Adlt Corrections☐ Corrections☐ Independent Comm☐ Delta Protection Comm☐ Delta Stewardship Council☐ Energy Commission☒ NAHC☐ Public Utilities Comm☒ Santa Monica Bay Restoration☐ State Lands Comm☐ Tahoe Rgl Plan Agency☐ Conservancy☐ Other:

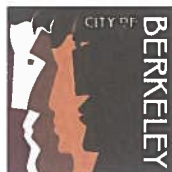
CalSTA

☐ Aeronautics☒ CHP☒ Caltrans # 4☐ Trans Planning

Other

☒ Education☐ Food & Agriculture☐ HCD☐ OES☐ State/Consumer Svcs☒ General Services

Office of the Mayor



Jesse Arreguín
Mayor

March 21, 2019

Letter A 5

Raphael Breines
Senior Planner Physical & Environmental Planning
University of California, Berkeley
300 A&E Building
Berkeley, CA 94720-1382

Re: Upper Hearst Development for the Goldman School of Public Policy and
Minor Amendment to the 2020 Long Range Development Plan, "Project"

Dear Mr. Breines and Capital Strategies Staff:

Thank you for the opportunity to comment on the DEIR for the above-referenced Project. My comments will be limited to the reference of increased enrollment in the aforementioned.

Increase in campus headcount by 11,285 students and its impacts were not studied under the 2020 LRDP and are, therefore, not "consistent" to the Project. The programmatic approach of the 2020 LRDP was done within the context that student population would grow by only 1,650 students between the 2001/02 academic year and then stabilize at that number by 2010. Instead, the student population has increased by almost 7 times over that studied in the 2020. Furthermore, the University stated that it would be constructing an additional 2,600 beds but to date has only built 1,119, including those at Blackwell Hall just completed at the beginning of the 2018/19 academic year. ***The effort to create a new population baseline in preparation for the next generation LRDP, within the context of this Project, is inconsistent and should be severed.***

A 5.1

This DEIR states, incorrectly, that there have been no significant impacts as a result of student population increase. However, this DEIR studied only the impact of the increased population *within the campus environment*. Housing for all of this population increase (and some studied in the 2020 LRDP – for whom housing was not developed) has had to be accommodated within the City Environs and has impacted the City in very significant ways. The increased population has, within the City of Berkeley:

A 5.2

Raphael Breines
Senior Planner Physical & Environmental Planning
University of California, Berkeley
March 21, 2019

- Contributed to the regional housing crisis and resulting homeless increase
- Impacted rental rates for Berkeley residents and students
- Increased water consumption, waste water, storm water contamination and solid waste
- Put pressure on public service resources by increasing the ratio of police to residents, contributed to device and laptop crime rate increases and ambulance transport demand
- Challenged Berkeley's Climate Action Goals through the increase in GHG emissions and individuals carbon footprint

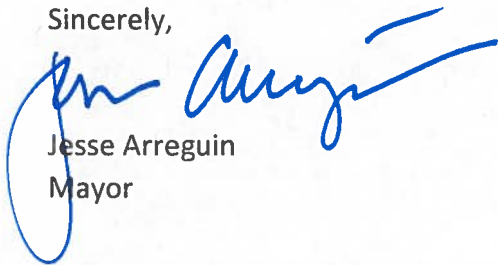
A 5.3

These impacts have not been studied as a part of this DEIR. It goes without saying that impacts, of such a significant increase in enrollment, do not evaporate when a student walks off-campus - especially since they do not live there.

Over the past two years my office has developed an excellent relationship with the Chancellor and have looked forward to the prospect of a true partnership between the City and the University. Attempting to include the impacts of a 7-fold increase in student population, above that previously promised, in this Project DEIR will be detrimental to our partnership moving forward. In respect for the future of this relationship and our ability to create mutual plans in growth and prosperity for **both the City and the University**, please remove the population increase from the consideration of this Project.

A 5.4

Sincerely,



Jesse Arreguin
Mayor

cc: Chancellor Carol Christ



Gavin Newsom
Governor

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit



Kate Gordon
Director

April 8, 2019

Raphael Breines
University of California, Berkeley
300 A&E Bldg.
Berkeley, CA 94720-1382

Subject: Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 LRDP
SCH#: 2003082131

Dear Raphael Breines:

The State Clearinghouse submitted the above named EIR to selected state agencies for review. The review period closed on 4/5/2019, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act, please visit: <https://ceqanet.opr.ca.gov/2003082131/30> for full details about your project.

A 6.1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse



Planning Departmental <planning@berkeley.edu>

Alameda CTC Response to the Notice of Availability of a Draft Supplemental Environmental Impact Report (SEIR) for the Upper Hearst Development

Christopher Marks <CMarks@alamedactc.org>

Fri, Apr 12, 2019 at 4:29 PM

To: "planning@berkeley.edu" <planning@berkeley.edu>

Cc: Saravana Suthanthira <SSuthanthira@alamedactc.org>

Hi Raphael,

Please see the attached comments from Alameda CTC regarding the Notice of Availability of a Draft Supplemental Environmental Impact Report (SEIR) for the Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan for the University of California, Berkeley (UC Berkeley) campus. It appears this project will reduce pm-peak trips and is therefore exempt from further analysis under our Congestion Management Program, Land Use Analysis Program.

Best,

Chris G. Marks, Associate Transportation Planner

Alameda County Transportation Commission

1111 Broadway, Suite 800, Oakland, CA 94607

510.208.7453 direct dial | 510.208.7400 main line

Email: cmarks@alamedactc.org Website: www.alamedactc.org

Facebook: www.facebook.com/AlamedaCTC Twitter: [@AlamedaCTC](https://twitter.com/AlamedaCTC)



Our mission is to plan, fund and deliver a broad spectrum of transportation programs and projects that expand access and improve mobility to foster a vibrant and livable Alameda County.



AlaCTC_Response_to_the_SEIR_for_the_Upper_Hearst_Development_for_the_GoldmanSchoolofPublicPolicy_and_Amendment_to_the_2020LRDP_for_the_UC_Berkeley_Campus.pdf

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April 12, 2019

Raphael Breines
Senior Planner
Physical & Environmental Planning
University of California, Berkeley
300 A&E Building
Berkeley, CA 94720

SUBJECT: Response to the Notice of Availability of a Draft Supplemental Environmental Impact Report (SEIR) for Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan for the University of California, Berkeley (UC Berkeley) campus

Dear Mr. Breines,

Thank you for the opportunity to comment on raft Supplemental Environmental Impact Report (SEIR) for Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan (LRDP) for the University of California, Berkeley (UC Berkeley) campus. The proposed project is located on an approximately one-acre site located at the northwest corner of La Loma Avenue and Hearst Avenue in the City of Berkeley. The proposed project includes 150 residential units (studio, one- and two-bedroom apartments) and 37,000 square feet of office, classroom, and event space in an academic building. The project would also remove approximately 207 parking spaces. As a result the SEIR estimates that the proposed project would result in a net reduction of 5 PM-peak-hour trips.

We have reviewed the project and determined that it is exempt from review under the Congestion Management Program, Land Use Analysis Program because the proposed project will not generate 100 new p.m. peak hour, and will reduce pm-peak hour trips. Additionally, the mitigation measures and continuing best practices from the 2020 LRDP, if fully implemented, could significantly offset additional auto traffic generated at other times of day. Alameda CTC encourages UC Berkeley to fully implement all the mitigation measures and best practices listed in the SEIR.

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Thank you for the opportunity to comment on this SEIR. Please contact me at (510) 208-7426 or Chris G. Marks, Associate Transportation Planner at (510) 208-7453, if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Saravana Suthanthira".

Saravana Suthanthira
Principal Transportation Planner

cc: Chris G. Marks, Associate Transportation Planner



Planning and Development Department

Letter A 8

April 12, 2019

Via Electronic Mail Only

Raphael Breines, Senior Planner
Physical & Environmental Planning
University of California, Berkeley
300 A&E Building, Berkeley, CA
94720-1382
planning@berkeley.edu

Re: Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan Draft Supplemental Environmental Impact Report to the UC Berkeley 2020 Long Range Development Plan EIR, SCH# 2003082131.

Dear Mr. Breines:

On behalf of the City of Berkeley, I am submitting the following comments on the draft Supplemental Environmental Impact Report (“SEIR”) for the project titled “Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan” (“Project”).

The City and the University of California, Berkeley (“University” or “UC Berkeley”) have a long history of working together on planning and development projects to ensure that our community remains vibrant, attractive, and safe. The California Environmental Quality Act (“CEQA”) plays a vital role in this planning process, as it allows the City to review specific development proposals, as well as longer-term planning efforts, undertaken by the University and ensure that the impacts of such projects on the surrounding community are adequately considered and mitigated. It is in this spirit of broader cooperation toward a common goal of maintaining our thriving community that we submit these comments.

Our overarching concern with the SEIR is that it combines environmental analysis of a specific development project—two new buildings for the Goldman School of Public Policy (“GSPP”)—with analysis of increased overall enrollment projections at the University through 2023. To avoid this significant and unnecessary confusion about

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what is under consideration, we yet again ask the University to revise the environmental analysis to consider these two distinct projects in separate documents.

In addition, the University must correct a number of significant flaws in its analysis of this Project. From a CEQA perspective, the SEIR lacks a clear, stable, and finite definition of what the Project is. On one hand, the “Project Description” suggests that the “Project” is nothing more than the expansion of the Goldman School of Public Policy, which involves the demolition of two parking areas and the construction of one academic building and one housing structure. However, the NOP and impact analysis sections tell a different story: There, the SEIR makes it clear that the University is also purporting to analyze the environmental impacts of dramatically increased student enrollment—nearly five times the increase anticipated in the 2020 LRDP.

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This foundational flaw dogs the SEIR throughout every impact analysis section. Without a clear definition of what the “Project” is, the public and decision-makers simply cannot tell what the impacts of approving the Project will be.

Ignoring the dramatic impact of exponential population growth and referring to it as a new “baseline” does not make it so. Legally, it violates CEQA. The law specifically requires that the University analyze and mitigate the impacts of such an increase. Exponential population growth without appropriate planning, analysis, and mitigations has a profound impact on the City of Berkeley – not to mention deteriorating quality of life for the student population. For example, an 8,000 student increase over the 2020 LRDP estimates for 2020—and projected 11,000 student increase through 2023—represents an approximate 9% increase in the City’s total population. Further, an 8,000 student increase for 2020 is nearly a 500% increase over LRDP estimates for 2020. This comes with the University’s admitted inability to house most of its students. The resulting displacement of City residents exacerbates the housing and homelessness crises, which disproportionately impacts the most vulnerable and thus should heighten, and not obscure, the University’s responsibilities. Unplanned, unmitigated and unanalyzed population growth stress the City’s already overtaxed services, such as police, fire and social services. These impacts reduce response times, potentially require new facilities and put others where there is no social safety net. All of these impacts must be identified, analyzed, and mitigated in revised environmental documents.

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The University does not contribute to the City’s general fund through property taxes or development impact fees, which are the primary funding sources for City services like police and fire. It does not house its population on campus. Nor does it pay to mitigate the off-campus impacts. In our comment letter, the City simply asks the University to comply with CEQA. This would require the University to pay its fair share to mitigate impacts caused by development projects and enrollment decisions.

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The City has engaged Economic & Planning Systems, Inc. (EPS) to study the fiscal impacts of these increased service demands on the City of Berkeley; while the

preliminary findings are presented below, a more thorough and complete analysis will require approximately four to six months to complete. According to these preliminary findings, the University's net fiscal impact on the City of Berkeley has increased from an estimated \$11 million per year in 2003 to *over \$21 million* for the year 2018 alone. This impact directly affects the City's ability to allocate resources to pressing environmental factors such as the local streets, storm drain, sewers, public buildings, public safety resources, and other infrastructure and services.

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The SEIR's analysis of the GSPP expansion is about one project, as opposed to the greatly expanded population's impact on the whole City. The GSPP expansion has a wholly different conflict with CEQA. While the City believes the GSPP expansion is a positive development in concept, the design clearly does not respect the historic resources in the surrounding neighborhood, as the City's Landmarks Preservation Commission indicated. The SEIR dismisses out of hand even modest measures that could reduce these impacts. Similarly, the SEIR glosses over the potentially significant noise, archaeological, air quality, and other impacts associated with this new development, as discussed in detail below.

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In addition, the University dismisses CEQA's requirements to consider public comment. The University indicated its commitment to the Project prior to certifying an EIR for it. *See e.g.*, Letter from Vini Bhargava, Director, Physical and Environmental Planning, UC Berkeley to Timothy Burroughs, Director, Department of Planning & Development, City of Berkeley dated March 14, 2019, (stating that the University would not grant a longer extension for the public comment period to May 1 because doing so would "push the GSPP project approval to a later Regents meeting, thereby jeopardizing the construction start date"). As the Supreme Court has held, "an agency has no discretion to define approval so as to make its commitment to a project precede the required preparation of an EIR." *Save Tara v. City of West Hollywood* (2008) 45 Cal. 4th 116, 132. This statement is also a clear indication that the University is not taking seriously its obligation under CEQA to consider public comments.

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In sum, the SEIR violates the minimum standards of adequacy under the California Environmental Quality Act ("CEQA"), Public Resources Code § 21000 et seq., and the "CEQA Guidelines," California Code of Regulations, title 14, § 15000 et seq. Moreover, the University's use of a supplemental—rather than a subsequent—EIR was inappropriate, as neither the GSPP project nor the exponential enrollment growth is consistent with the LRDP analyzed in the previous EIR. Given these flaws, the University must prepare a new EIR with a clear project description and thorough impact analyses.¹

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¹ The City prepared these comments in consultation with Shute, Mihaly & Weinberger LLP; LSA; and Economic & Planning Systems, Inc. Attachment A to this letter is a report prepared by

I. The SEIR's Flawed Project Description Does Not Permit Meaningful Public Review of the Project.

A. The University's Increased Enrollment Is Part of the Project, Not the Baseline, and the SEIR's Failure to Describe It as Such Violates CEQA.

An EIR must accurately and consistently describe the project it analyzes. Guidelines § 15124; Guidelines § 15378 (defining “project”); *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 192-3 (“An accurate, stable, and finite project description is the *sine qua non* of an informative and legally sufficient EIR.”). An inaccurate or incomplete project description undermines CEQA’s purposes because it thwarts a full analysis of project impacts, thus minimizing the project’s effects. *City of Santee v. County of San Diego* (1989) 214 Cal.App.3d 1438, 1454; *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 656 (“*San Joaquin Raptor*”). Thus, when an EIR gives “conflicting signals to decision-makers and the public about the nature and scope of the activity being proposed,” the courts have found it “fundamentally inadequate and misleading.” *San Joaquin Raptor Rescue*, 149 Cal.App.4th at 655-56.

Here, the SEIR fails this fundamental test by including an unclear and inconsistent description of the “project” being analyzed. In some places, the SEIR states that the “project” is simply the expansion of the Goldman School of Public Policy (referred to herein as “GSPP” or “GSPP Project”), while in other places the SEIR indicates that the “project” is the GSPP *plus* the increase in enrollment projected at the University through 2023. For example, the Executive Summary and Introduction state that the spiking enrollment is not part of the “project” but instead is just an “updated population baseline.” See, e.g., SEIR at 3, 6. The impact analysis sections, however, treat the updated enrollment numbers as a change in the original LRDP *project* and purport to analyze whether the impacts associated with the dramatic enrollment increase projections were adequately assessed in the original EIR for the 2020 LRDP. See, e.g., SEIR at 54 (concluding that there would not be increased aesthetic impacts associated with the increase in campus headcount); see also SEIR at 45 (“The environmental analysis of each impact category in Section 6 of this SEIR takes into account the updated campus headcount baseline and explains how the increased campus headcount factors into and/or affects the *environmental analysis and significance conclusions* reached in the 2020 LRDP Final EIR and this SEIR.”) (emphasis added); Notice of Availability of Draft SEIR (indicating that the SEIR provides “a program-level analysis of development anticipated

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EPS. We respectfully refer the University to that report, both here and throughout these comments, for further detail and discussion of the SEIR’s inadequacies. We request that the University reply to the comments in this letter and to the comments in the attached EPS report.

to accommodate current and projected enrollment at the UC Berkeley campus”). This ambiguity in the project description renders the entire SEIR analysis invalid.

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Moreover, it is clear from the SEIR and CEQA itself that the significantly increased enrollment numbers must be part of the project, and not just part of an updated “baseline,” for at least two reasons.

First, CEQA specifically requires the University to analyze and mitigate the impacts of dramatically increased enrollment, i.e., treat massive increased enrollment as a project subject to environmental review. See PRC § See Cal. Pub. Res. Code § 21080.09(a) (requiring the University to analyze and mitigate for change in enrollment levels); 14 C.C.R. § 15081.5(b) (same). This is exactly what the University did in the original 2020 LRDP EIR, where the projected 2020 enrollment numbers were not part of the *baseline* but rather part of the *project* being analyzed. See LRDP EIR, Section 3.1.5 (including “Campus Population” as part of the LRDP, i.e., the project being analyzed); Section 5.1.1 (analyzing a “lower enrollment” project alternative). Thus, to the extent the SEIR is analyzing a change in enrollment, it is analyzing a change in the LRDP itself, not the baseline.

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Second, the SEIR’s analysis of the increased enrollment clearly purports to look at the *impacts* of that action. Under CEQA, a “baseline” has no environmental impacts; it is the existing environment. Guidelines § 15125. Only “projects” have impacts. Thus, the analysis contained in the SEIR itself provides strong evidence that the increased enrollment is part of the project, not the baseline.²

Because the SEIR fails to accurately describe the project as including the changes in enrollment, and instead repeatedly refers to this project element as part of a “baseline update,” the SEIR violates CEQA. Any revised environmental document must include the changed enrollment numbers as part of the project description, or separate this part of the project out and analyze it in a separate document.

Moreover, to the extent the SEIR purports to analyze the potential impacts of the changed enrollment, that analysis is also inadequate. We will address these inadequacies in our discussion of the specific impact areas. For convenience, we refer to

² The SEIR also never relies on the “updated” enrollment numbers (40,955 students enrolled and total campus headcount of 57,637, as of the date of the Notice of Preparation) as a baseline for analyzing any of the Project’s impacts. SEIR at 44. In fact, rather than using a proper baseline—i.e., existing environmental conditions on the ground—to analyze most Project impacts, the SEIR repeatedly states that the Project’s impacts would be less than significant because the LRDP is not physically built-out. But comparing the proposed Project to the LRDP does not provide an adequate CEQA analysis. Rather, the SEIR must analyze whether the Project has significant impacts compared to existing conditions, not to prior plans. Guidelines § 15125(a).

the GSPP portion of the project as “GSPP” or “GSPP Project.” We refer to the enrollment changes as the “Enrollment Project.”

B. Components of the GSPP Project Are Not Adequately Described.

In addition to the Project Description flaws related to the Enrollment Project, the SEIR also fails to adequately describe all of the components of the GSPP Project. In some cases, aspects of the GSPP Project critical to its analysis are omitted altogether. For example, the SEIR indicates that the Project would include use of bio-retention facilities that ensure no net increase in the volume of stormwater runoff. SEIR at 129. But the SEIR fails to identify the location of these facilities or to provide any details about their capacity and function. This information is critical to understanding the GSPP Project and whether the proposed low-impact development (LID) facilities are feasible to install or may result in additional impacts.

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Many LID infrastructure projects implemented by the City are being implemented within street rights-of-way. For example, the City installed a bioswale at the corner of Hearst and Oxford that includes approximately 200 square feet of area to capture and treat stormwater. Personal Communication, C. Borg (consultant planner to the City) and D. Akagi, Engineer, City of Berkeley, April 2, 2019. Here, because the proposed GSPP building does not provide the setbacks required by the City, and because the LID facilities are not described, it is unclear where the LID facilities could be located and whether they will be adequate.

Similarly, the SEIR acknowledges that construction would involve a variety of construction vehicles, including haul trucks, water trucks, dump trucks, and concrete trucks (SEIR at 66) but fails to include a Construction Traffic Management Plan. According to the SEIR, Continuing Best Practices TRA-3-a, TRA-3-b, and TRA-3-c describe measures for reducing or minimizing traffic impacts during construction. SEIR at 164. These measures include preparation of a Construction Traffic Management Plan for *each* construction project. Id. Such plans are important to ensure that traffic and public safety impacts are minimized, especially when construction takes place in an urbanized, congested area such as this campus in Berkeley. But the Construction Traffic Management Plan does not appear anywhere in the document. (And to the extent the University would treat these plans as mitigations rather than part of the Project, their omission from the SEIR would be an impermissible deferral of mitigation.)

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In another example, the SEIR provides no information on the number, size, time of day, or frequency of events to be held at the event center, which will be part of the academic building. As a result, it is impossible to determine whether these events will cause significant noise and traffic impacts, impacts to pedestrians, or other impacts, either separately or cumulatively with the nearby Greek Theater, for example. In addition, the SEIR fails to describe exterior lighting on the terrace, which could result in light and glare impacts.

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The SEIR also provides no information on the dewatering process to be used during construction. The SEIR discloses that Project excavation is estimated to be 23 feet below ground surface, which may require dewatering. SEIR at 127. However, other than a statement that dewatering activities would have to comply with the applicable National Pollutant Discharge Elimination System (“NPDES”) permit, the SEIR provides no details related to these activities, e.g., where the referenced dewatering features will be located, what provisions will be in place to contain sediment, what measures will be in place to prevent contamination of the storm drain system. Without a detailed project description that includes these basic planning and design considerations, the SEIR will remain incapable of addressing and analyzing the Project’s important environmental effects.

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In addition, the proposed mitigation to address impacts on the historic character of the area may result in redesign of the project. SEIR at 93. However, because this mitigation is deferred, the SEIR fails to describe the redesign called for to address identified impacts. *Id.* Because of this unstable GSPP Project description, it is impossible for decision-makers and the public to evaluate the Project’s impacts, whether redesign of the site to protect all the potentially effected resources is feasible, and whether the identified impacts will indeed be mitigated.

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In sum, the SEIR fails to describe the project with sufficient accuracy and specificity. The failure to describe the whole of the project is a serious and pervasive deficiency, as it renders faulty the environmental impact analyses as well as the discussion of potential mitigation measures to minimize those impacts. A revised environmental document must provide accurate information including, but not limited to, a sufficient description of anticipated special events; construction activities, including a description of the Project’s dewatering plan; and any other Project details relevant to its potential environmental impacts. This information is necessary to allow decision makers, the public, and responsible agencies to evaluate potential environmental impacts.

II. The University May Not Tier Off of the LRDP EIR for this Project as Neither the Enrollment Project or GSPP Project Is Consistent with the 2020 LRDP.

It is inappropriate for the University to tier its analysis of either the GSPP Project or the Enrollment Project off the 2020 LRDP EIR because neither Project is consistent with the 2020 LRDP.

Tiering is a method of conducting environmental review in sequence, from an EIR covering general matters and environmental effects associated with a general plan or program to a narrower or site-specific EIR. Pub. Res. Code § 21068.5. Tiered environmental review is applicable only to a later project that is “[c]onsistent with the program, plan, policy, or ordinance for which an [EIR] has been prepared and certified,” consistent with local land use plans and zoning, and “[n]ot subject to Section 21166.” *Id.* at § 21094(b)(1)-(3). The purpose of tiering is to “exclude duplicative analysis of

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environmental effects examined in previous [EIRs].” *Town of Atherton v. California High-Speed Rail Authority* (2014) 228 Cal.App.4th 314, 344 (citations omitted).

Because the current enrollment figures are substantially different from the figures used in the 2020 LRDP EIR, a tiered environmental review of this increase in enrollment is inappropriate. The enrollment increase described in the SEIR is not a site-specific project or a narrower project than the 2020 LRDP. Instead, it represents a fundamental change to the assumptions in the 2020 LRDP regarding the number of students assumed in that plan. The massive increase in enrollment of more than 8,000 students is patently inconsistent with the previously planned increase of 1,650. Similarly, the SEIR itself states that the GSPP Project is inconsistent with the LRDP, and actually requires an amendment. SEIR at 41 and 134. Given these inconsistencies, tiering is inappropriate here.³

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Indeed, in litigation filings the University has acknowledged the shortcomings of the existing 2020 LRDP EIR as the basis of later tiered analyses: “Long term planning documents remain valid, and the EIRs for those documents remain useful for tiering, so long as the predictions hold true. However, when predictions become outdated, the lead agency must re-examine impacts at the time of the *next discretionary approval*.” Regents Reply to Opposition to Demurrer to Third Amended Petition, *Save Berkeley’s Neighborhoods v. Regents of the University of California* (Jan. 8, 2019) at 8 (emphasis in original). Because the University’s enrollment predictions in its 2020 LRDP EIR have not held true, the 2020 LRDP EIR no longer remains useful for tiering. As a result, the University must re-examine the impacts of the enrollment increase, and may not simply tier this analysis off the 2020 LRDP EIR.

III. A Supplemental EIR Is Not Appropriate Here, Given the Significant Changes Proposed to the LRDP.

The EIR prepared by the University purports to supplement the 2020 LRDP EIR. However, a supplemental EIR is appropriate only if an EIR has already been prepared for a project, that project is subsequently changed, and “[o]nly minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the same situation.” Guidelines § 15163.

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Here, an EIR was prepared for the LRDP. However, the dramatic increase in the enrollment numbers proposed in the Enrollment Project will require significant, rather than minor, changes to the 2020 LRDP. As such, the supplemental EIR prepared by the University is inadequate. Instead, a subsequent EIR must be prepared. Guidelines § 15162.

³ Additionally, tiering is inappropriate for the Enrollment Project because the enrollment increase is a substantial change subject to CEQA § 21166. CEQA § 21094(b)(1)-(3).

IV. The SEIR Is Inadequate Under CEQA.

A. The Project Would Substantially Increase the Local Population and Exacerbate Inadequate Housing Conditions for University Students and for City of Berkeley Residents.

It is important to keep in mind the context of the University's decision when considering this Project. The Bay Area is experiencing a housing crisis. Moreover, UC Berkeley students are experiencing this crisis through severe housing insecurity and, in some cases, homelessness.

The Project includes a substantial increase in the campus population. Notice of Preparation for the Draft SEIR for the Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan at 2. As the SEIR makes clear, the University has not provided sufficient housing to accommodate this increased population. SEIR at 151 (UC Berkeley has added 1,119 student beds through the end of 2018, leaving a balance of almost 1,500 student beds remaining under the 2020 LRDP's development parameter of 2,600 student beds, which were intended to accommodate student enrollment of 10,000 fewer people than is now being projected). In fact, a 2017 report prepared by the University's Office of Planning and Analysis as part of the UC Berkeley Office of the Chancellor's Housing Initiative (hereafter referred to as "Housing Survey") found that the demand for campus housing significantly outpaces supply and that UC Berkeley has the lowest percentage of beds for its study body of any UC campus in the State. *See*, <https://chancellor.berkeley.edu/task-forces/housing-initiative> and Housing Survey Findings by UC Berkeley Office of Planning and Analysis, Fall 2017 at slide 2 *available at* https://housing.berkeley.edu/sites/default/files/pdf/HousingSurvey_03022018.pdf

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Available and planned housing stock in the City is not sufficient to serve this increased population. The dearth of housing available to students has resulted in housing insecurity for many of the University's students. For example, the University's Housing Survey found that ten percent of students have experienced homelessness while attending UC Berkeley, while the number for doctoral students is twenty percent. *Id.* at 10.

The SEIR acknowledges the shortage of student housing. SEIR at 151. The SEIR also acknowledges that "most of the additional campus population would live in Berkeley or nearby parts of the Bay Area." SEIR at 130. However, rather than analyzing impacts from the massive increased enrollment above and beyond the planned enrollment projected in the LRDP, the SEIR rationalizes that because the increase in population would represent a small percentage of the projected increase in the *entire Bay Area's* population from 2000 to 2020, the increased enrollment would not substantially effect the regional population. *Id.* However, as discussed below, this rationale does not comport with CEQA guidance for analysis of impacts associated with population and housing.

Under CEQA, a project has significant impacts if it would “induce substantial population growth *in an area*, either directly...or indirectly...” CEQA Guidelines, Appendix G, section XIV.a. and SEIR at 149. In this case, it is reasonable to assume that new students, faculty, and staff would be drawn to living in Berkeley due to the City’s proximity to campus and the campus’ location in the heart of the City. The increase of 11,000 students is roughly equal to nine percent of the City of Berkeley’s population. U.S. Census Bureau, 2017 (Berkeley population in 2017 was approximately 122,324). Thus the increased population represents a significant increase in population to the City.⁴

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The University’s failure to provide housing for this increased population places a burden on the City and results in significant impacts that have not been addressed in the SEIR. Specifically, the increased demand for housing has increased pressure for development in the City. The City has seen a marked increase in development applications over prior years particularly for the development of multi-unit housing developments typically marketed to students.

Moreover, a substantial number of housing units constructed in the City of Berkeley are being leased to the University for exclusive use by students. Specifically, multiple new developments built by private developments have been ‘master leased’ by the University and have been taken off the market for other users. These projects include the New Sequoia Apartments at 2441 Haste, the Garden Village Apartments at 2201 Dwight Way, and the Shattuck Studios at 2711 Shattuck. The City has also seen a trend of landlord preference to rent housing units to students, often at higher resident densities than usual and not in household arrangements. These trends combine to effectively displace non-student Berkeley residents from the housing market in the City. The lack of adequate campus housing for students reduces available supply of housing for non-student residents and displaces existing residents, including residents in historically low-income neighborhoods such as South and West Berkeley. This has the effect of reducing the racial and economic diversity of Berkeley.

The Regional Housing Needs Allocation (RHNA) for Berkeley, mandated by State Housing Law, calls for the creation of 2,959 new units between 2014 and 2022, including 1,558 units below 120% area median income. As of September 2017, Berkeley has approved only 50% of these RHNA recommendations, including 94% of the Market Rate housing goal and 10% of the Below Market Rate housing goal. Unfortunately, the RHNA does not take into consideration student housing. As a university town, Berkeley’s

⁴ It is not reasonable to assume, as the SEIR does (SEIR at 149-50) that the relevant “area” of impact is the entire Bay Area. This assumption only serves to minimize the impact of this dramatic increase in enrollment. Moreover, the SEIR provides no evidence to support this assumption, such as statistics on where University students tend to live or would prefer to live, as living far from campus compromises the student experience. In fact, this same analysis suggests that the additional students would live in Berkeley. SEIR at 150, 151.

rental market includes a constant influx and changing tenancies of students, in addition to the needs of our workforce and long-term residents.

The use of master leasing, whether through the purchasing of existing units or earmarking units that are proposed or under construction, places a burden on the Berkeley community as this removes units from the general rental market, making it more difficult to achieve the RHNA goals. While solutions to the student housing shortage should be multi-pronged, it should not be done at the expense of housing availability in the greater community.

Homelessness—whether it results from students who are unable to afford housing or residents who are displaced by students living off campus and driving up rents—also leads to physical impacts on parks, streets and other public spaces, public safety issues related to homeless encampments locating in unsafe locations, and an increase in public health problems.

The SEIR fails to discuss any of the aforementioned impacts. It provides no data on current and anticipated housing stock on campus or within the City of Berkeley and surrounding communities. It provides no data regarding the number of homeless UC Berkeley students and fails to analyze how the substantial increase in campus population will contribute to higher housing insecurity for both students and residents of Berkeley.

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B. The Increased Enrollment Will Result in a Substantial Increase in Service Population that Will Significantly Impact Public Services.

The SEIR is especially lacking in its analysis of impacts to public services. Massive increased enrollment at the University results in direct and indirect impacts to a broad range of City services, including but not limited to, police, fire services, and public health. Under CEQA a project has significant impacts if it would result in the need for new or altered facilities that would cause significant environmental impacts “in order to maintain acceptable service ratios, response times, or other performance objectives” for fire and police protection, schools, parks, and other public facilities. CEQA Guidelines Appendix G Section XV.a. Here, the Project will increase the University’s enrollment by approximately 11,000 students, which has the potential to increase service ratios, response times or other performance standards for public services. Therefore, the SEIR has an obligation to fully evaluate these impacts.

1. Police Services

In evaluating the Enrollment Project’s impacts on police protection, the SEIR acknowledges that the increased enrollment would increase the service population for police protection. SEIR at 156. The SEIR also acknowledges that the University’s police department currently fails to meet service ratio goals. Id. The SEIR even concedes that the Enrollment Project would frustrate service ratio goals by reducing the service

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ratio from the current 1.6 officers per 1,000 to a projected 1.1 officers per 1,000 people. Id. Furthermore, the UCPD has had a reduction of their force and there is no information on how the University has maintained their commitment to assign ten (10) University police officers on a full-time basis to work jointly with the City police officers in areas proximate to the Campus as per the Mitigation Implementation Agreement By and Between the City of Berkeley and the Regents of the University of California. Yet, the SEIR provides no information about the ramifications of this reduced level of service. It fails to evaluate the impacts of relying more heavily on the City's police department to fill the gap in services and it fails to analyze potential changes in response times due to the increased service population.

While UC Berkeley has a police department (UCPD), the City of Berkeley provides extensive back up and off campus services related to the student population and the University. With the limited amount of on-campus housing, more students live off campus and thus within the sole jurisdiction of the BPD. The City's recent experience serving new student housing facilities off-campus strongly indicates that the massive enrollment increase will adversely affect response time. Some of the new housing development projects in the City are affiliated with the University (*see* <https://housing.berkeley.edu/>) and, as discussed above, many others are built by private developers but are largely rented to students. These developments are located in the City's jurisdiction and therefore require services from the City's police department that in some cases are beyond the average service provided citywide. For example, the Berkeley Police Department routinely directs several officers in the nuisance abatement unit to monitor and respond to calls in the Clery Act crime reporting area of the City, which is predominantly occupied by students. The inevitable increase in student housing to accommodate the large enrollment jump will necessitate increased police services as well.

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In fact, according to the EPS Report attached as Attachment A, calls for police service from within UC Berkeley and its environs increased from about 14 percent to 19 percent of the citywide total in 2003 and 2018, respectively. EPS Report at 3. The Berkeley Police Department already provides services to many University events and allocates resources for officers to attend student judicial affair hearings and safety presentations. In addition, the City anticipates being called upon to provide increased support at football and other sporting events and to provide increased policing to more densely populated areas.

Moreover, the SEIR fails to address the University's recent increased reliance on City of Berkeley police services due to civil unrest at protests and riots related to events on campus. These services require a significant commitment of City resources both in terms of service hours and fiscal resources, and likely correspond to reduced service ratios and increased response times that may necessitate the need for additional personnel and equipment. The SEIR fails to analyze these impacts and its conclusion that

impacts related to police protection services would be less than significant lacks evidentiary support.

2. Fire and Emergency Medical Services

As explained in the EPS Report, while UC Berkley has its own fire inspection and code enforcement personnel, it does not maintain a firefighting team or Emergency Medical Services (EMS) staff. As a result, the BFD provides the vast majority of fire and emergency medical protection for the campus. The EPS analysis estimates BFD costs at over \$9.9 million in 2018, with approximately 37 percent of the total cost of service attributable to the University. Actual BFD costs attributable to the University could be even greater due to the complex firefighting and EMS environment created by the unique, high-density and/or high capacity structures owned and operated by UC Berkeley.

UCB and Berkeley Labs have extensive amounts of hazardous materials, including nuclear, that require high risk operations by Berkeley firefighters. The unique circumstances of the campus, its buildings, facilities (stadium, labs, etc.) and chemical, biological, nuclear and other materials requires special training that would not be required of a normal fire department, and exposes BFD to significant additional risk, far above and beyond a normal fire department. In addition, the campus topography, tall buildings, canyon, location on the Hayward fault, vegetation, large venues such as Memorial Stadium, Edwards Stadium, Hass Pavilion, Greek Theater, and Zellerbach Hall all are hugely impactful to our firefighters and EMS.

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The increase in building height and densities, such as is found with higher density apartment buildings to accommodate students, also present unique challenges for fire fighters and medical personnel. Personal Communication, C. Borg consulting planner to the City, D. Brannigan, Fire Chief, City of Berkeley, March 29, 2019. Responding to calls for service in these housing environments require twice the staff on fire engines and trucks because these calls require evacuation and management of hundreds of people. Id.

Similarly, the SEIR's evaluation of Project-related impacts to fire protection and emergency medical services is equally deficient. The SEIR acknowledges that the Project would increase the service population for fire protection. SEIR at 157. Nonetheless, the SEIR claims that the dramatic expansion of student enrollment will not increase the need for expanded services and dismisses potential impacts as insignificant, without any analysis or support. To the contrary, the dramatic increase correlates with an increase in the City's residential population, which in turn will result in an increase in service calls for fire protection and for emergency medical services provided by the BFD. Having failed to adequately evaluate the Project's impacts on response times and service level, the SEIR also fails to identify mitigation for this impact. Once again, the SEIR relies on the 2020 LRDP EIR and points to "Best Practices" to mitigate any impacts. Id.

However the Best Practices alluded to only provide for continued partnership with the City and other agencies and do nothing to address the change in service population.

In evaluating service levels for emergency medical services, the Unit Hour Utilization (UHU) is a calculation that measures the amount of time a transport unit is staffed, on duty, and assigned to providing response, triage, treatment and transport of patients in a given period of time. Personal Communication, C. Borg consulting planner to the City and D. Sprague, Assistant Fire Chief, City of Berkeley, April 1, 2019. UHU times are influenced by road conditions, the time it takes to manage an incident, and transport times to various facilities. Together, these factors are used to calculate the amount of time that a service vehicle is in-service and available for calls. A higher UHU per service vehicle means lower availability for service calls and poor availability indicates increases in response times. BFD's current estimated UHU for the four emergency medical service vehicles is approximately 0.39, which as shown in the table below is considered to be in the Above Average utilization range. Id.

Unit Hour Utilization Range
.55 - .45 – High Utilization
.45 - .35 – Above Average Utilization
.35 - .25 – Average Utilization
.25 - .15 – Below Average Utilization
.15 - .01 – Low Utilization

(Smiley, 2011)

The BFD estimates that they get approximately 15,000 service calls annually or 0.125 calls per capita. Personal Communication, C. Borg consulting planner to the City and D. Sprague, Assistant Fire Chief, City of Berkeley, April 1, 2019. The increase in student enrollment would translate to roughly 1,375 *additional* service calls per year. Id. In addition, with the anticipated closure of Alta Bates Hospital in Berkeley, service calls for emergency medical services are likely to increase even more. Id. This increase in service calls is significant and will affect the UHU and ultimately the BFD's response rate for service calls. Id. The BFD anticipates that the increased service calls will result in a need for additional personnel and new facilities to accommodate them. Id.

The SEIR should have evaluated the impacts of the massive enrollment increase on fire and emergency medical services. Instead, the SEIR once again, relies on unsupported statements to conclude that impacts related to fire and emergency medical services will not be significant. SEIR at 157.

3. Public Health Services

Finally, the SEIR ignores the Project's impacts on public health services. The City's Health, Housing and Community Services Department ("HHCS Department") provides public health services to Berkeley residents, including University students who live in the City. HHCS operates a number of inspection, support, and outreach programs that support a safe and healthy environment for City and UC residents.

One of the HHCS Department's objectives is to control and prevent the occurrence and spread of communicable diseases. While the University provides clinical services for students suffering from infectious disease, it is HHCS that manages the public health aspect of those cases (i.e., investigation of exposure potential and follow-up). Personal Communication, C. Borg, consulting planner and Lisa Hernandez, Health Officer City of Berkeley, March 29, 2019. In some cases, a high volume of the cases HHCS manages is related to University students. For example, between 2011 and 2018, 40 percent of tuberculosis cases managed by HHCS were student related. Id. Services associated with managing these cases include contacting contagious people and any others that may have been exposed to them, testing of all of the individuals, and treatment that lasts for approximately six months. Id. These services require a substantial commitment of City staff time and fiscal resources. Id.

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Similarly, during the same time period, HHCS managed a substantial number of University student sexually transmitted disease cases. Id. University students comprised 14 percent of syphilis cases, 16 percent of gonorrhea cases, and 20 percent of chlamydia referred to HHCS. Id. These cases are less intensive to manage and treat but have a much higher rate of incidence (hundreds of cases annually) and are predominantly experienced by young adults (e.g., college-aged students). Id. Thus, the increase in student enrollment will add to the already strained ability of the City's HHCS to provide services related to public health, which could result in the need for additional facilities and staff. Id. These impacts should have been evaluated as part of the SEIR. CEQA Guidelines Appendix G Section XV.a.

In summary, the SEIR's evaluation of Project-related impacts on public services is inadequate because, rather than actually addressing the public services that will be needed in light of an increase in 11,000 students, the SEIR relies on the unsupported statement that public services will not change because the 2020 LRDP has not been fully built-out (physically). However, population has far exceeded projections, creating significant new demands on City services. A revised EIR must be prepared to analyze the potentially significant impacts caused by the expanded enrollment.

4. Massive Enrollment Increase Imposes Substantial Costs on the City.

It is important that the City and the University work together to ensure that City services and University programs remain in balance. However, the University failed to consult with the City regarding this Project, and particularly about the planned enrollment increase. City services are already burdened with providing services to a growing population. As discussed above, the proposed Project exacerbates demands on fire, police, and public health services. The SEIR acknowledges the University's dependence on City services for fire and police protection, but falls far short of analyzing the Project's impacts on the both the University and the City's ability to provide adequate services.

The cost to the City of providing these services to 11,000 new students, as well as to the existing University population, is staggering. The EPS Report, which is Attachment A to this letter, estimates that the University's annual net fiscal impact on the City of Berkeley has increased from an estimated \$11 million in 2003 to over \$21 million in 2018. Costs result from demand for public services, with the analysis evaluating the University's impact on major City departments. In cases where the University partially covers its service demands by providing its own set of services (e.g., campus police, onsite open space, and recreational facilities), the analysis considers net demand on City services. The analysis also evaluates revenue accruing to the City that is attributable to UC Berkeley, including sales tax and other tax and fee revenues, as well as payments made as part of a 2005 settlement agreement.

Since 2003, the demand for services generated by the University has grown relative to citywide demand, with the University's service population and calls for service now making up a greater share of the citywide totals. For example, calls for police service from within UC Berkeley and its environs increased from about 14 percent to 19 percent of the citywide total in 2003 and 2018, respectively.

The City's most substantial cost burden caused by the University is the provision of fire and emergency services. While the University has its own fire inspection and code enforcement personnel, it does not maintain a firefighting team or Emergency Medical Services (EMS) staff. As a result, the Berkeley Fire Department (BFD) provides the vast majority of fire and emergency medical protection for the campus. The cost of these services is estimated at over \$9.9 million in 2018; actual BFD costs could be even greater due to the complex firefighting and EMS environment created by the high-density structures owned and operated by UC the University.

Nowhere in the SEIR does the University discuss the feasibility of contributing its fair share towards these services. *City of Marina v. Board of Trustees of*

A 8.24



the California State University (2006) 39 Cal.4th 341, 359-60. Moreover, to the extent that the University is relying on its 2005 Settlement Agreement with the City of Berkeley to mitigate the Project's impacts to City services, the SEIR provides no evidence to support such a conclusion. As shown in the EPS Report, the amount of mitigation funding provided through that Agreement is insufficient to offset the actual costs of services. In any event, the Agreement expires by its own terms in Spring of 2021 and therefore cannot be relied upon to address impacts beyond that date.

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C. The SEIR's Analysis of Traffic and Transportation Impacts Is Incomplete and Flawed.

The SEIR's analysis of transportation impacts fails to achieve CEQA's most basic purpose: informing governmental decision-makers and the public about the potential significant environmental effects of a proposed activity. Guidelines § 15002(a). CEQA additionally requires "adequacy, completeness, and a good-faith effort at full disclosure" in an environmental document. Guidelines § 15003(i). Here, the SEIR's analysis of the Project's traffic impacts fails to meet these standards.

The SEIR's deficiencies related to the traffic analysis include: (1) failure to analyze traffic impacts from the whole of the Project; (2) lack of empirical data to support trip generation assumptions; (3) failure to analyze construction period traffic impacts; and (4) failure to analyze Project impacts on pedestrian and bicycle facilities. Each of these deficiencies is described below.

1. Analysis of Trip Generation Is Flawed

As discussed above, one of the flaws that implicates all of the sections of the SEIR is the failure to adequately analyze the impacts associated with the increased headcount. The addition of approximately 11,000 students generates more traffic citywide and generates a need for increased infrastructure. The SEIR asserts that potential environmental impacts associated with the increased headcount were accounted for in the analysis provided. SEIR at 168. The basis for this statement appears to be a comparison between vehicle trip generation estimates for the 2001-2002 academic year and vehicle trip generation estimates for the 2017-2018 academic year. This comparison (presented in SEIR at Table 19) shows that the campus generates fewer vehicle trips despite the increase in student population. But, the trip generation calculation appears to be based solely on student commute surveys, rather than on empirical data. The information provided by these surveys is questionable at best, and falls short of substantial evidence. Traffic impact analysis best practices routinely include explicit trip generation and distribution assumptions for all project elements. This should include any redistribution of campus uses that have been relocated off the campus core.

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Under CEQA, an EIR is obliged to support its conclusions with facts. *See Berkeley Keep Jets Over the Bay Com. v. Board of Port Cmrs.* (2001) 91 Cal.App.4th

1344, 1371 (striking down an EIR “for failing to support its many conclusory statements by scientific or objective data”). Even if the SEIR could rely on student commute surveys alone, the SEIR failed to provide any details about the survey. The SEIR fails to describe the survey questions or the sample size of students to whom it was administered, and fails to include employees, professors, etc. who also commute. It provides no corroborating evidence whatsoever to support the SEIR’s conclusion. Without additional information about the survey and empirical data to support the trip generation estimates, the SEIR’s assertions are unsupported.

Similarly, the SEIR states in several instances that the loss of approximately 207 existing marked and attendant parking spaces (due to implementation of the GSPP project) is estimated to reduce trip generation from existing conditions. However, the SEIR provides no evidence to show that parking demand is reduced by increases in non-automobile travel. It is possible that a reduction in parking supply at the project site could result in higher parking demand elsewhere. The SEIR only presents a concurrent comparison showing an increase in BART ridership at the Downtown Berkeley station. SEIR at 167 and 168. An expanded description of alternative travel modes, reduction in parking spaces, and increase in student beds is provided in the UC Berkeley Long Range Development Plan Trip Generation Comparison (Fehr & Peers, September 2018). However, the information provided in this report states that the number of parking permits issued has declined by 100 between 2001-2002 and 2017-2018. Evidence that 100 fewer parking permits are issued does not support the assertion in Table 19 that AM and PM peak hour trips are reduced by more than 300 or that parking supply could be reduced by more than 100 spaces.

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Existing traffic volumes are also used to support the trip generation conclusions. The LRDP Trip Generation Comparison (Fehr & Peers, September 2018) includes a comparison of traffic volumes collected during the AM and PM peak hours at intersections in 2002 to traffic volumes collected at the same intersections in 2017 and 2018. This data is presented as evidence of the effectiveness of the LRDP’s Transportation Demand Management (“TDM”) program. SEIR Appendix G – Fehr and Peers Memo dated September, 2018 at 3 and 4. While traffic volumes on Hearst Avenue, Oxford Street, and Bancroft Way appear to have declined over the period, changes to traffic volumes or traffic patterns on City streets may result from factors other than land uses within the University. Here, again, the SEIR fails to provide empirical data specific to the University (such as vehicle counts at University access points or data on parking demand that is met off-site) to support its assertions regarding the effectiveness of the University’s TDM program.

This SEIR’s approach of failing to provide empirical evidence to support its assertions violates CEQA. An EIR must contain facts and analysis, not just an agency’s bare conclusions. *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 568. Nor may an agency defer its assessment of important environmental impacts until

after the project is approved. *Sundstrom*, 202 Cal.App.3d at 306-07. An EIR's conclusions must be supported by substantial evidence. *Laurel Heights I*, 47 Cal.3d 376 at 409. The SEIR fails to meet these standards.

2. Failure to Analyze Construction Period Impacts

The SEIR fails to provide analysis describing Project-related impacts to traffic during the construction period. The SEIR provides no analysis of construction worker trips and parking, and no analysis of material hauling. The SEIR relies on LRDP Continuing Best Practices TRA-3-a, TRA-3-b, and TRA-3-c for reducing or minimizing traffic impacts during construction. These measures include preparation of a Construction Traffic Management Plan for each construction project. However, as presented in the SEIR, the Continuing Best Practices do not include, as they should, City review and approval of the Construction Traffic Management Plans. The City of Berkeley Guidelines for Development of Traffic Impact Reports require coordination with City staff when evaluating traffic impacts. The City of Berkeley Guidelines for Development of Traffic Impact Reports at 1. A revised analysis should include provision for City review and approval of the Construction Traffic Management Plans prior to issuing relevant permits.

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3. Failure to Analyze Impacts to Pedestrian and Bicycle Facilities

The City of Berkeley Guidelines for Development of Traffic Impact Reports state that projects generating fewer than 25 net peak hour trips should still provide analysis of pedestrian, traffic, and bicycle traffic. The guidelines specifically state that "Impacts on alternative modes can result from projects that in themselves generate a significant number of trips for these modes or that are located on roadways that have been designated to serve these modes of travel." The City of Berkeley Guidelines for Development of Traffic Impact Reports at 8. If, as the traffic analysis contends, fewer automobile trips are generated and walking and bicycling commuting has increased and will continue to increase, then the traffic analysis must analyze the potential impacts to the facilities accommodating these modes of travel. For instance, if the travel volume of alternative modes exceeds the capacity of their facilities, the Project would lead to a substantial hazard and to unsafe conditions for pedestrians or bicyclists.

Specifically, the analysis should identify existing pedestrian and bicycle travel paths to/from the University, calculate the capacity of these routes, quantify travel volumes, determine existing volume to capacity ratios and level of service, forecast future travel volumes, determine future volume to capacity ratios and level of service, and disclose and mitigate any project impacts to pedestrian and bicycle facilities.

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D. The SEIR Fails to Adequately Analyze or Mitigate the Project's Significant Impacts Related to Air Quality.

1. Consistency with the Clean Air Plan

The SEIR concludes that the proposed Project would not result in significant Project or cumulative air quality impacts that result in conflicts with the regional air quality plan. SEIR at 65-67. However, the document reaches this conclusion without completing the required analysis related to the Project's air emissions. Specifically, the SEIR acknowledges that the 2020 LRDP EIR concluded that campus growth may not be consistent with the most recent Clean Air Plan ("CAP"). SEIR at 64. Moreover, despite the fact that the proposed Project includes construction of a building in a zone not previously identified in the LRDP, the SEIR concludes that because the University has not built out to the capacity of the 2020 LRDP, there is no need to conduct additional analysis. This approach violates CEQA. First, the Bay Area Air Quality Management District ("BAAQMD") published an updated CAP in 2017. The proposed Project, which entails both the GSPP building and the increase in enrollment, must be evaluated against the most current CAP and not against older documents.

In addition, the SEIR restates the LRDP EIR's conclusion that with implementation of mitigation measures in that EIR, the LRDP "would likely" be in compliance with air quality plans. SEIR at 64. The LRDP EIR's noncommittal assertion is not evidence of compliance. Nor is this failure remedied by the mitigation measures proposed. As described in the SEIR, the mitigation measures for potential inconsistency with the CAP include working with the City, ABAG, and BAAQMD to ensure that campus growth is accurately addressed in the CAP. Id. However, the SEIR fails to document any coordination efforts between the University and the identified agencies and if the increase of 11,000 students combined with the proposed GSPP project are inconsistent with the current CAP, coordination alone will not alter the inconsistency.

Under CEQA, a proposed project will have a significant impact if it "[c]onflicts with or obstruct[s] implementation of the applicable air quality plan." Guidelines, Appx. G(III)(a). The BAAQMD CEQA Guidelines recommend a three-step analysis for determining whether a project is consistent with a Clean Air Plan. The three questions to be answered are:

- (1) Does the project support the primary goals of the Clean Air Plan (attain air quality standards, reduce population exposure and protect public health, reduce GHG emissions and protect the climate)?;
- (2) Does the project include applicable control measures from the Clean Air Plan?; and
- (3) Does the project disrupt or hinder implementation of any Clean Air Plan control measures?

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BAAQMD CEQA Guidelines at 9-2 to 9-3. The SEIR did not perform this or any other analysis of the Project's consistency with the 2017 Clean Air Plan. Therefore, the SEIR's approach violates CEQA. The SEIR must be revised to include a true analysis of whether the proposed Project, which entails both the GSPPs buildings and the increase in enrollment, conflicts with or obstructs implementation of the Bay Area's CAP.

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2. The SEIR's Evaluation of Project-Related Exposure of Sensitive Receptors to Pollutant Concentrations Is Incomplete

The SEIR's analysis of exposure of sensitive receptors to pollutant concentrations is inadequate because it fails to analyze whether the project area would be exposed to substantial pollutant concentrations. The BAAQMD provides stationary source screening analysis tools that should have been used to determine the risk levels of stationary sources within 1,000 feet of a project site. The SEIR does not discuss the potential risk to residents of the project site from the existing stationary sources of pollutants in the project vicinity, which could be potentially significant.

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3. Cumulative Air Quality Impacts

The SEIR's analysis of cumulative air quality impacts is also incomplete. First, the SEIR limits its review of potential air quality impacts to the GSPP portion of the Project and ignores emissions associated with the increase in student enrollment. This myopic approach ignores the indirect impacts associated with the spiking enrollment increase, such as emissions associated with students commuting to the University from other parts of Berkeley and other cities in the Bay Area.

Second, the CalEEMod analysis employed by the SEIR to estimate Project emissions fails to account for construction of the parking garage. The garage should have been identified as an additional proposed land use within the model. This omission results in an underestimation of the project construction and operational impacts.

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Finally, because the SEIR's transportation analysis assumes that no new vehicle trips would be generated compared to existing conditions, it fails to present an accurate estimate of the Project's total operational emissions. SEIR at 66. Thus, the SEIR's conclusion that total operational emissions would be below the BAAQMD thresholds is unreliable. Once the traffic analysis is corrected and the SEIR identifies the number of trips or amount of vehicle miles travelled ("VMT") that can reasonably be expected to be generated by the GSPP Project and the massive enrollment increase, a revised environmental document must include a revised air quality analysis.

4. The SEIR Fails to Evaluate Impacts Related to Health Risk

The SEIR fails to conform to CEQA because it fails to include a health risk assessment (“HRA”) and fails to provide evidence to support its assertion that the Project would not result in impacts associated with toxic air contaminants. SEIR at 67. Since the release of the 2020 LRDP, the BAAQMD has published a stationary source screening tool that identifies sources of toxic air contaminants in the project vicinity. For example, the Lawrence Berkeley Laboratory is located just east of the project site. The screening level data provided by the BAAQMD⁵ indicates this facility generates an increased cancer risk of 144.36 cases per million, which exceeds the BAAQMD CEQA threshold of 10 in 1 million. Therefore, further analysis of this source needs to be conducted to determine the future impact of this facility on future residents of the project site. This data and data from other stationary sources should be referenced to document and disclose sources of TACs in the project vicinity to determine whether the project would expose future occupants of the GSPP buildings or new students, faculty and staff to a cancer risk above the threshold of 10 in one million.

In addition, the SEIR fails to assess the Project’s health risks associated with construction emissions. The BAAQMD 2017 CEQA Guidelines include project specific thresholds for construction risk assessments. Construction of the proposed project may expose surrounding sensitive receptors to airborne particulates, as well as construction equipment pollutants (usually diesel-fueled vehicles and equipment). The SEIR indicates that the 2020 LRDP EIR evaluated construction activities. SEIR at 65. However, the LRDP EIR analysis did not account for the updated guidance issued by the California’s Office of Environmental Health Hazard Assessment (OEHHA) and the BAAQMD’s Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, which contains updated guidance for age sensitivity factors, age exposure variables, and exposure duration. Under the updated analysis methods, cancer risk estimates could increase by a factor of three, even under the same emission rates.

The City and other nearby jurisdictions typically require all construction projects to implement diesel particulate matter controls during construction. The City requires project applicants to prepare a health risk assessment or equip all construction equipment with Tier 2 or higher engines and the most effective Verified Diesel Emission Control Strategies (VDECS) available for the engine type as certified by the California Air Resources Board (ARB), to ensure construction would not expose nearby offsite sensitive receptors to substantial pollutant concentrations during project construction and

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⁵ BAAQMD, 2012. Alameda County Stationary Source Screening Analysis Tool.
<http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools>

requires implementation of equipment emission reduction measures. Without such emission controls or project specific health risk assessment, the project may expose sensitive receptors to pollutant concentration in excess of the BAAQMD health risk standards. If particulate emissions exceed the BAAQMD thresholds, the Project may expose nearby sensitive receptors to an elevated health risk, which would likely require the preparation of a health risk assessment.

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In summary, a revised environmental document must evaluate the Project's construction- and operation-related emissions impacts, to include the necessary analysis and identify mitigation for any significant impacts.

E. The SEIR Fails to Adequately Analyze or Mitigate the Project's Significant Impacts Related to Greenhouse Gas Emissions.

1. The Project Will Generate Greenhouse Gas Emissions that Could Result in Significant Impacts.

The SEIR's evaluation of impacts related to greenhouse gas ("GHG") emissions is incomplete and flawed. As an initial matter, the SEIR's failure to present a complete analysis of the Project's traffic-related impacts implicates its GHG analysis. Inasmuch as the greenhouse gas emissions are dependent on the transportation analysis assumptions, any underestimation of vehicular trips necessarily results in an underestimation of vehicle-related greenhouse gas emissions. Once the University accurately models the Project's increase in traffic volumes, it must revise the greenhouse gas emissions impact analysis. Additionally, the SEIR inaccurately defines the Service Population (SP) of the campus. According to the BAAQMD CEQA Guidelines, for purposes of determining GHG impacts, the service population is determined by adding the number of residents to the number of employees (page 9-5)⁶. The service population identified in Table 8 of the SEIR appears to include all students, not just resident students as allowed under the BAAQMD Guidelines methodology. The actual service population calculation would be much lower when commuter students are omitted. This error drastically underestimates the Per SP Emissions (Table 8) for the campus, which in turn results in an underestimation of GHG emissions.

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In addition, the SEIR concludes that the Project would not result in significant impacts related to generating a significant amount of greenhouse gas emissions but fails to provide support for this conclusion. SEIR at 114 and 115. The SEIR relies on two lines of reasoning to reach this conclusion. First, it claims that because the GSPP Project is within the development parameters of the 2020 LRDP, the greenhouse gas emissions associated with this component of the Project would not be

⁶ BAAQMD, 2017. *CEQA Air Quality Guidelines*. May.

additional to those anticipated in the LRDP. SEIR at 114. However, as discussed above the SEIR cannot rely on the LRDP's status to justify foregoing analysis.

Next, the SEIR improperly avoids analysis of potential impacts by relying on Project features to mitigate Project-related impacts. The SEIR describes a list of design features for the GSPP Project and concludes that these features would reduce the Project's greenhouse gas emissions to an insignificant level. SEIR at 115. CEQA does not allow an EIR to fold what is effectively an assumed mitigation measure into a significance determination—the project's significant impacts must be determined first, and then the EIR must identify enforceable mitigation that will “offset” the impacts. See *See Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 656, 658 (rejecting EIR that relied on project modifications to find no significant impact, instead of identifying significant impacts and considering mitigation measures). *Lotus* held that an EIR was legally inadequate where it assumed certain mitigation techniques would be incorporated into the project, and thus the EIR did not disclose the impacts of the project without those special techniques. See *id.*

A 8.32

Further, the court in *Lotus* held that the EIR there was inadequate because it “fail[ed] to discuss the significance of the environmental impacts apart from the proposed ‘avoidance, minimization, and/or mitigation measures’ and thus fail[ed] to consider whether other possible mitigation measures would be more effective.” *Id.* at 657. Such is the case here: the SEIR relies on a list of Project design features as a key factor in its determination that Project-related impacts would be less than significant. See SEIR at 115. In so doing, the SEIR fails to reveal the true nature of the impacts and to consider other feasible mitigation measures and their effectiveness, in violation of CEQA.

2. The SEIR Fails to Support Its Conclusion that the Project Would be Consistent with Applicable Plans.

The SEIR concludes that the Project would contribute to greenhouse gas emissions impacts and to inconsistency with the UC Carbon Neutrality Initiative and Sustainable Practices Policy and Executive Order B-55-18 requiring carbon neutrality statewide by 2045. SEIR at 104,109, 116, and 118. But the SEIR fails to describe the extent and severity of this impact (by way of quantifying Project-related emissions), a clear violation of CEQA.

A 8.33

The SEIR's proposed mitigation for this impact calls for the University to purchase carbon offsets and/or renewable energy certificates to reduce annual campus-wide greenhouse gas emission to 1990 baseline levels. SEIR at 118. However, due to the qualitative nature of the SEIR analysis, there is not clear evidence regarding the amount of GHG emission reductions that can be achieved through the implementation of UC Sustainable Practices Policy or any other measured sustainability approaches Project-related GHG emissions. Without a quantitative analysis it is virtually impossible to determine the amount of carbon offsets/renewable energy certificates that would be

required to offset the GHG emissions to meet the State's 2030 and 2050 emission targets and/or the UC Climate Neutrality goals, or if other mitigation measure would be more appropriate. Therefore, the SEIR must quantify the Project's effects related to greenhouse gas emissions, and the efficacy of the proposed mitigation, so that the public and decision makers may reach their own conclusions. *Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal.App.4th 99, 130.

Moreover, offsets alone will not fully mitigate the Project's impacts. In practice, even the most sophisticated offset programs have failed. A 2016 report prepared for the European Union Directorate General for Climate Action concluded that nearly 75% of potential certified offset projects had a low likelihood of actually contributing additive GHG reductions, and less than 10% of such projects had a high likelihood of additive reductions. See Attachment B, *How Additional is the Clean Development Mechanism? Analysis of the application of current tools and proposed alternatives*, Institute of Applied Ecology, March, 2016 at 11; see also Attachment C, *Carbon Credits Likely Worthless in Reducing Emissions*, Study Says, Inside Climate News, April 19, 2017. If an offset program does not achieve additive reductions, it will not actually mitigate a project's GHG emissions. Because of these known problems with enforcement and efficacy, agencies typically permit offsets to constitute only a very small part of an overall emission reduction program. For example, California's cap and trade program allows no more than eight percent of GHG reductions to come from offsets, which will drop to four percent in 2021, at which point at least half of the offsets used must "provide direct environmental benefits in state." Health & Safety Code § 38562(c)(2)(E).

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The problems with the University's carbon offset program extend beyond the fact that offsets may not be available or effective. CARB explicitly prioritizes onsite measures to reduce a project's GHG emissions: "[t]o the degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from VMT, and direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits locally." See Attachment D, CARB's 2017 Climate Change Scoping Plan, at 102 (emphasis added). Here, however, the University does not intend to require that GHG mitigation be local or even within the County. Thus, instead of mitigating GHG emissions by, e.g., implementing adequate on-campus residential development to reduce VMT, the University intends to simply write a blank check for carbon "offsets," some of which could be out of the Bay Area region. SEIR at 118. This approach is directly contrary to CARB's recommendation to prioritize onsite GHG emission reduction. CARB's 2017 Climate Change Scoping Plan, at 102.

Finally, the SEIR's analysis is flawed because it limits its analysis of the Project's consistency to only a subset of relevant plans and policies. For example, the SEIR fails to analyze the Project's consistency with the City of Berkeley's Climate

Action Plan. Without analysis of the Project's consistency with the City's Climate Action Plan the SEIR's analysis is incomplete and therefore inadequate.

F. The SEIR's Analysis of Noise Impacts Is Incomplete and Flawed.

The SEIR acknowledges that the Project site is surrounded by noise-sensitive receptors: multi-family residential housing, student housing, and occupants of nearby academic buildings. SEIR at 139. Despite the potential to affect hundreds of receptors, the SEIR presents a flawed analysis of project noise impacts that fails to fully analyze impacts to adjacent noise sensitive land uses. To conclude, as the SEIR does, that an impact is less than significant, the analysis must be supported with substantial evidence. Substantial evidence consists of "facts, a reasonable presumption predicated on fact, or expert opinion supported by fact," not "argument, speculation, unsubstantiated opinion or narrative." Pub. Res. Code § 21080(e)(1)-(2). Once again, the SEIR fails on many levels.

First, the SEIR improperly relies on measured existing ambient noise levels taken along Hearst Avenue during the noisiest time of day (i.e., 4:00 to 5:00 pm) on a weekday, when traffic levels are highest during the afternoon peak hour. SEIR at 140. These readings (approximately 65 dBA) are misleading because they do not account for the quieter nighttime and morning hours and do not reflect ambient noise levels at the adjacent residential community. In fact, the SEIR itself discloses that noise levels just across the street from the proposed GSPP site near the multi-family residences on La Loma measured 58.7 dBA. Id. at Table 11. Therefore, the SEIR's reported existing ambient noise levels are artificially high and skew the analysis.

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The SEIR then assumes that the elevated ambient noise levels of 65 dBA, because they would exceed the City's baseline allowable daytime exterior noise level, become the daytime standard for purposes of analyzing the Project's noise impacts. SEIR at 144. This assumption is wrong and is not based on any policy of the City of Berkeley or the University. Thus, the SEIR's selection of this threshold of significance is not supported by substantial evidence.

The noise analysis also inadequately describes sources of noise from the Project. For example, the SEIR fails to evaluate the impact of the Project's operational noise sources including outdoor activities associated with special events and HVAC operation. The noise analysis should have identified whether the outdoor activity space would include any amplified music or public address systems and should have included a description of the anticipated programming and use of the space. The SEIR does none of this.

In addition, the SEIR identifies Project-related potential vibration impacts to adjacent structures from typical construction activities, such as vibration rollers. SEIR at 147. The SEIR concedes that Project construction would cause vibration levels in

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excess of the vibration limit of 0.2 inches per second peak particle velocity identified in the LRDP. Id. The SEIR then relies on implementation of LRDP Mitigation Measure NOI-5 to reduce impacts from expected vibration levels on adjacent historic structures and other buildings. However, Mitigation Measure NOI-5 applies only to pile driving activities, which are not proposed activities at the GSPP site. SEIR at 143. Therefore, it is unclear how this measure would be implemented during construction of the GSPP component of the Project. Additionally, NOI-5 does not have a performance standard to ensure that building damage would be avoided. The SEIR fails to provide any other measures to address this potentially significant impact to nearby buildings and fails to provide evidence that Mitigation Measure NOI-5 will be effective at mitigating the impacts, let alone to less-than-significant levels.

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Moreover, the SEIR's method for estimating noise levels from the Project is inconsistent with the City's Municipal Code. *See* Berkeley Municipal Code Section 13.40.050. The Code has noise standards that specify noise limits within specific time periods, with more stringent limits between the hours of 10:00 p.m. and 7:00 a.m. Id. A revised environmental document should assess noise levels associated with the project for this time period.

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Finally, the SEIR proposes only minimal measures to lessen the severity of noise impacts and absolutely no measures to avoid them. The Salter Noise Study identified specific building acoustical enhancements that are required for the project to meet the City's interior noise standards. Charles Salter letter report to Melissa Godfrey at Solomon Cordwell Buenz dated May 9, 2018 at 2 and 3. The SEIR failed to incorporate these recommendations as mitigation measures for the GSPP project. Instead, the SEIR relies on LRDP Mitigation Measure NOI-3, which states only that the University will comply with building standards and that housing built in areas where noise exposure levels would exceed 60 Ldn would incorporate design features to minimize noise exposure to the occupants. SEIR at 142. Mitigation Measure NOI-3 fails to include specific measures or performance standards to ensure that noise standards will be met. A revised environmental document should incorporate the Project-specific recommended measures provided in the Salter Noise Study.

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In short, the SEIR's analysis of noise impacts dramatically understates the Project's potential to significantly affect area residents. At the same time, the SEIR fails to provide effective, enforceable measures to mitigate such potentially significant impacts. To comply with CEQA, the University must prepare an EIR fully analyzing the Project's potential impacts and identifying effective mitigation measures.

G. The SEIR Fails to Adequately Analyze the Project's Land Use Impacts.

The SEIR acknowledges that the GSPP Project is inconsistent with the City's General Plan and Zoning Ordinance in numerous ways: It is too dense, too tall, and ignores all setback limits. See SEIR at 137-38. The SEIR fails to analyze any

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potential mitigation measures to address these land use incompatibilities, however, stating out of hand that any such mitigation “would impair attainment of Project objectives to meet housing demand.”

The SEIR fails to provide any evidence to support this summary conclusion, in plain violation of CEQA. In fact, the SEIR repeatedly states that the University has ample opportunity to build housing according to the approved 2020 LRDP elsewhere on campus. SEIR at 15. This evidence indicates that the University could meet its objectives of increasing housing supply by building on-campus while also reducing the height of the proposed GSPP buildings (and increasing their setbacks) in compliance with the City’s land use standards.

Nor can the University ignore the impacts of these inconsistencies solely because the University is not subject to the City’s land use planning jurisdiction. The GSPP Project is right on the edge of the University and thus will necessarily impact properties outside the University’s boundaries. The City’s height and setback requirements are designed to prevent adverse aesthetic impacts in the community. Under CEQA, the University must consider those impacts even if they occur outside the University’s boundaries. *Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal.3d 553, 575 (“[A]n EIR may not ignore the regional impacts of a project proposal, including those impacts that occur outside of its borders.”); see Guidelines § 15126.6(f)(1); see also *Save the Plastic Bag Coal. v. City of Manhattan Beach* (2011) 52 Cal.4th 155, 173 (“Indeed, ‘the purpose of CEQA would be undermined if the appropriate governmental agencies went forward without an awareness of the effects a project will have on areas outside of the boundaries of the project area.’”); see also *City of Marina*, 39 Cal.4th at 359-60; *City of San Diego v. Bd. of Trustees of Cal. State Univ.* (2015) 61 Cal.4th 945, 961.

Lastly, the University fails to identify other inconsistencies with the City’s code. For example:

- **Affordable Housing and Child Care.** The General Plan’s Housing Element expressly identifies the need for the University of California to “maximize the supply of appropriately located, affordable housing for its students and also to expand housing opportunities for faculty and staff.” Policy H-21. Similarly, the General Plan’s Land Use Element seeks to “[m]inimize the negative impacts of the size of the University population and University expansion on adjacent neighborhoods and the city as a whole.” Policy LU-36. The General Plan also calls more generally for the encouragement of “housing production adequate to meet City needs and the City’s share of regional housing needs.” Policy H-32. The GSPP Project does not appear to provide any housing dedicated as affordable, and thus is inconsistent with these policies. The Enrollment Project plainly conflicts with these policies as well, as the SEIR acknowledges. SEIR at 151 (“[t]he

additional student population would exceed anticipated growth in UC Berkeley-provided housing, placing greater demand on the private housing market”). The University also is not paying the City’s affordable housing mitigation fee (BMC § 22.20.065(A)8; Resolution No. 68, 074-N.S) or the affordable child care fee (Resolution 66,618-N.S.).

- **Historic Resources.** The Berkeley General Plan Urban Design and Preservation Element includes a policy calling for the use of “a wide variety of regulatory, incentive, and outreach techniques to suitably protect Berkeley’s existing built environment and cultural heritage.” To enact this policy, the General Plan calls for the “identif[ication] and protect[ion] [of] historically significant structures, sites, districts, and neighborhoods.” Policy UD-1. Despite these policies, the SEIR describes the proposed residential building’s massing and design as “depart[ing] from and compromise[ing] the setting of adjacent historic resources that were built in the First Bay Tradition of architecture.” SEIR at 56. This inconsistency undermines the General Plan’s goal of protecting the City’s cultural heritage.
- **Noise.** The Berkeley Municipal Code provides exterior noise standards according to zoning districts, and based on the time of day. BMC § 13.40.050. In particular, the Municipal Code provides noise standards between 7 A.M. and 10 P.M. which differ from the standards that apply between 10 P.M. and 7 A.M. *Id.* at Table 13.40-1. The GSPP Project fails to comply with these noise standards.
- **Public Art.** Municipal Code Chapter 23C.23 provides that construction projects incorporate publicly accessible art or contribute a percentage of the project cost for public art elsewhere in the City. Municipal Code § 23C.23.050 General Requirements. This project fails to do either and is thus inconsistent with the City’s code.

In analyzing the potential land use impacts of the Enrollment Project, the SEIR states that the only potential impacts are those related to “physical development on the UC Berkeley Campus and City Environs.” SEIR at 132. Not so. As the SEIR elsewhere acknowledges, the University is increasing enrollment without increasing on-campus housing for these students. This means any additional students must find off-campus housing, most likely in Berkeley. Attracting huge new populations without planning for or providing housing is contrary to the affordable housing policies discussed above. These impacts must be analyzed and mitigated in a revised environmental document.

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H. The SEIR Fails to Adequately Analyze or Mitigate the Project's Significant Impacts Related to Cultural Resources.

1. The SEIR Fails to Adequately Describe Existing Conditions at the Project Site.

The SEIR acknowledges that construction of the proposed GSPP component of the Project has the potential to result in impacts to adjacent historic structures as well to as unearth historic archaeological resources associated with a former building beneath the site's existing paved surface. SEIR at 90 to 94. However, the SEIR provides an incomplete description of existing cultural resources. First, the SEIR fails to identify a third listed City Landmark across the street from the Project site and another designated City Landmark comprised of a cluster of houses designed by significant Berkeley architects. *See* Letter from the Landmarks Preservation Commission providing comments on the Draft SEIR for the GSPP dated March 7, 2019 at 1.

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Second, the SEIR also fails to provide the necessary details to adequately identify the likelihood of significant archaeological resources on the GSPP site, thus failing to establish the project site's baseline conditions for cultural resources. Specifically, based on the nature of prior historic-period land uses on the GSPP project site, there is a reasonable potential for the presence of the archaeological remains of Newman Hall/Holy Spirit Parish, the Roman Catholic student center associated with UC Berkeley from 1905 to the 1960s. *Id.* Given the nature of a portion of the project site, that of a minimally modified surface parking area, it is possible, even likely, that remains from the Newman Hall/Holy Spirit Parish complex persist under the surface capped with asphalt. Yet, the SEIR fails to provide a detailed investigation of these potential resources.

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Depending on the general date that this portion of Berkeley received water and sanitation service for the first time, other prior land uses that pre-date the Roman Catholic phase of the project site may have resulted in hollow/fill features (such as backfilled wells and/or privies) that could have been effectively capped by subsequent development. Such features are notorious, if intact, for containing well-preserved archaeological deposits with a high degree of "visibility" and "focus," which are archaeological concepts related to the abundance of material (visibility) and the specificity of the association between those deposits and a particular occupation, event, or family (focus).

These types of deposits, depending on the nature of their preservation (archaeological integrity), have a high potential to contain information that would render them eligible for inclusion in the California Register of Historical Resources (CRHR) because of containing "... information important in prehistory or history" (PRC Section

5024.1(c)(4)). Should these deposits or features be so eligible, then they would qualify as archaeological manifestations of a historical resource, as defined at PRC Section 21084.1, and their destruction by proposed construction would result in the material impairment of the significance of said resources, which would be a significant impact under CEQA.

Additionally, although the project site does not contain known precontact archaeological deposits according to UC Berkeley's confidential resource map, the absence of evidence does not indicate evidence of absence, particularly in this part of Berkeley that has yielded precontact archaeological deposits in the past. Based on the nature of prior land uses within the GSPP project site, as well as the minimal nature of apparent subsurface modification in portions of the site, the potential for intact features and deposits that could qualify as historical resources under CEQA justify a more robust identification effort to inform the SEIR and to serve as a basis for determining if the LRDP 2020 analysis and mitigation measures are adequate. In other words, the development of a sensitivity assessment would appear to be warranted given the known prior land use, which represents potentially significant historical associations with religious life at UC Berkeley in the early 20th century.

Therefore, a more expansive discussion of the likelihood that archaeological deposits and/or features exist beneath the parking lot could be informed by an examination of historic-period maps, demolition permits, diocese records, and former members of the congregation and/or neighborhood. At a minimum, such an analysis should include the following information: (a) whether the former buildings and structures have basements, which are often receptacles of historic-period artifacts that may have been filled and paved over; (b) whether there were wells or privies located on the property, which are often similarly "sealed" by subsequent construction; and (c) whether the previous buildings/structures were removed only from the ground up, leaving subsurface features relatively intact. Given these factors at the GSPP site, the SEIR should have included a sensitivity assessment, to support an analysis of whether or not it is likely that such deposits and/or features exist.

2. The SEIR Fails to Adequately Analyze or Mitigate Impacts Relating to Archaeological Resources.

Under CEQA, an agency may not defer its assessment of important environmental impacts until after the project is approved. *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, at 306-307. CEQA requires that the extent and severity of the Project's impacts be determined now and not at a future date. For this Project, the nature of any architectural remains or subsurface features would only be perceivable through archaeological investigation. As discussed above, the SEIR foregoes thorough investigation to determine whether sensitive archaeological resources exist on the GSPP site.

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Having failed to describe the existing conditions, the SEIR concedes that unknown underground resources might exist and relies on Continuing Best Practice CUL-4b to minimize impacts. This measure essentially describes a reactive contingency policy to respond to archaeological discoveries during construction. However, the SEIR fails to provide evidence that this measure will adequately protect buried resources. Artifacts such as these are a delicate, nonrenewable resource that is easily damaged. A mitigation measure that generally calls for stopping work if resources are discovered does nothing to protect the resources from being destroyed by large construction vehicles during excavation. Moreover, most construction workers are not adequately trained and knowledgeable enough to identify such resources so that there is a high likelihood that artifacts would suffer damage before they are discovered.

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An alternate approach could involve preconstruction archaeological testing to identify the nature and extent of possible archaeological deposits, an evaluation of such deposits' eligibility for the California Register of Historical Resources, and, should the deposits qualify as a historical resource, the mitigation of their loss through the implementation of a data recovery program. Preservation in place is the "preferred manner" of mitigating impacts to archaeological historical resources. *Madera Oversight Coalition, Inc. v. County of Madera* (2011) 199 Cal.App.4th 48. Therefore, this testing should take place prior to recirculation of a revised CEQA analysis.

3. The SEIR Provides an Incomplete Analysis of Impacts to Identified Historic Resources

The SEIR provides an incomplete evaluation of impacts to known historic resources. Specifically, the SEIR provides no justification for conclusory statements that the proposed project is compliant with the Secretary's Standards with respect to Founder's Rock. The SEIR states that the Project would not result in a visual intrusion on Founder's Rock because the proposed project is "far enough away." SEIR at 90. The SEIR fails to provide sufficient comparative basis to assert compliance with the Secretary's Standards No. 9 and 10. A revised EIR should include information about the sightlines to and from Founder's Rock and a ranking of these views on a hierarchical scale to determine which ones are most important as contributors to the setting of the resource.

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4. The SEIR Defers Mitigation of Significant Impacts to Identified Historic Resources

Lastly, the SEIR fails to adequately mitigate for identified significant impacts to known historic resources. Under CEQA, the University cannot defer identifying mitigation until after Project approval, or delegate that authority to staff, in the absence of clear performance standards. *Sundstrom*, 202 Cal.App.3d at 307, 309 (county improperly deferred mitigation to later administrative approval and improperly

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delegated the county's legal responsibility to staff). Thus, the SEIR's approach does not comport with CEQA.

First, the Berkeley Landmarks Preservation Commission (LPC) and Design Review Committee (DRC) reviewed schematic plans for the proposed project in 2018. Based on that review and a presentation by the University, both the LPC and DRC noted their concern with several aspects of the project and its potential to impact adjacent historical resources. The crux of the concerns lay in “. . . the mass, scale, and non-contextual architectural design and palette of materials of the GSPP development, vis-à-vis neighboring historic resources, among other concerns.” SEIR at 87. In addition, the proposed building will include a high intensity reflective roof, which may result in glare impacts to uphill neighbors.

Rather than affirmatively addressing the City's concerns, the SEIR acknowledges the Project's significant impacts to the adjacent historic resources but then fails to adequately mitigate these impacts. SEIR at 93. Instead, the SEIR mitigation measure MM-CUL-1 calls for consultation with an historic architect to modify the building design. *Id.* This approach impermissibly defers analysis and mitigation of the Project's effects until future redesign as required by mitigation measure MM-CUL-1. It also wholly undermines the SEIR's purpose as an informational document, since it suggests the Project as described may be wholly redesigned after approval.

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Second, as discussed above in section IV.F of this letter, the SEIR identifies the potential for significant impacts to the adjacent historic structures due to vibration during construction of the GSPP building. SEIR at 147 and 148. However, as explained in more detail above, the proposed mitigation for this impact is wholly inadequate. A revised environmental document should include more robust mitigation, including but not limited to preparation of a Vibration Management and Monitoring Plan to be adopted prior to Project approval. At a minimum, this Plan would:

(a) be prepared, reviewed, approved, and administered collaboratively by a qualified Acoustical Engineer, the Structural Engineer, and the Historic Architect;

(b) require pre-construction surveys of the existing historic buildings;

(c) include clear objectives and performance standards that establish damage thresholds for the adjacent historical resources, develop procedures and alternative approaches for construction/demolition to ensure that the resources do not sustain the intensity of vibration that would result in damage, and identify the persons responsible for developing, reviewing, and approving aspects of the Vibration Monitoring Plan.

I. The SEIR Fails to Adequately Analyze or Mitigate the Project's Significant Impacts Related to Water Quality and Hydrology.

The SEIR's treatment of the Project's water quality impacts fails to provide the public and decision-makers with essential information about the Project. The SEIR fails to adequately analyze project impacts associated with hydrology and water quality because, among other reasons, existing setting information is missing as discussed below. In addition, the SEIR wrongly assumes that, aside from risks associated with flooding, the potential environmental impacts resulting from the increase in campus headcount are limited to physical development on the UC Berkeley campus. SEIR at 126. This assumption is incorrect. The increase in campus headcount also results in indirect impacts associated with construction of new housing elsewhere in the city to accommodate the substantial increase in the number of students.

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1. The SEIR Fails to Describe the Existing Setting.

The SEIR fails to adequately describe the existing hydrologic setting of the receiving waters for drainage from the project site. Specifically, the SEIR fails to describe baseline conditions for surface waters (i.e., Strawberry Creek) that would be impacted by the Project. Instead, the SEIR refers to a description of conditions in the LRDP EIR prepared in 2004. However, the SEIR cannot rely on a description of conditions fifteen years ago. It must describe the current water quality conditions. A current description is particularly important here because the 2004 LRDP EIR disclosed that Strawberry Creek experiences increases in pollutants during rain events. LRDP EIR at 4.7-14 and 15. Heavy rains in the years since the LRDP was prepared, and especially in recent months, may have altered conditions in the creek. Therefore, an updated description of water quality conditions is important information from which to establish a baseline.

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Without a proper description of baseline conditions, the SEIR is unable to provide an adequate analysis of Project-related contributions to changes in water quality relative to existing conditions. A revised analysis must include a Hydrology and Water Quality section that adequately describes the hydrologic setting.

2. The SEIR Fails to Evaluate Impacts from the Whole of the Project.

As discussed above, the increased headcount associated with the Project results in indirect impacts to off-site infrastructure. Specifically, as discussed throughout this letter, the addition of approximately 11,000 students generates a need for providing housing, infrastructure, and services, which in turn results in induced growth that will likely result in a need for upgraded stormwater facilities.

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The SEIR acknowledges the potential for construction of the GSPP component of the Project to result in increased sediment in discharge water and on haul truck tires to enter storm drains and sewers, causing inlets to clog and reducing the functional capacity of pipes to convey flows. SEIR at 126. Nonetheless, the SEIR fails to evaluate the extent and severity of this potential impact and fails to describe project features for curtailing erosion and sedimentation and fails to describe measures to avoid or minimize the impact.

In addition, the SEIR fails to evaluate impacts of the increased headcount on the City's stormwater system. Part of maintaining the City's stormwater infrastructure includes maintaining screens that capture litter to prevent clogging in the system. Personal communication, C. Borg (consulting planner to the City) and M. Buttress, Engineer, City of Berkeley, April 2, 2019. Models that track high litter areas around the City consistently show that higher density areas produce more litter and require more intensive maintenance consisting of periodic cleaning of litter screens. Id. As discussed throughout this letter, much of the new housing being constructed is located in high density areas of downtown and south Berkeley. It is reasonable to assume that many of these new apartments will be occupied by University students. Therefore, the increase in students results in indirect impacts to City infrastructure and the need for increased maintenance.

Instead of analyzing and mitigating these impacts, the SEIR repeatedly violates CEQA by relying solely on best management practices and yet-to-be prepared plans and reports. For example, the SEIR acknowledges the need for the Project to include preparation of a Stormwater Management Report and to identify Low Impact Development Techniques. SEIR at 128. However, the SEIR fails to provide the required report, fails to describe the specific stormwater techniques that would be used (providing only a generic laundry list of possibilities), and fails to provide evidence that the Project design would not result in impacts.

Moreover, the SEIR relies on compliance with UC Berkeley's Best Practices and cites adherence to Best Practices HYD-1-a through HYD-1-1d as mitigating measures. Id. However, these practices also fail to ensure that no impacts would result. For instance, Best Practice HYD-2-a states that the University would "continue to review each development project to determine whether project runoff would increase pollutant loading." SEIR at 125. Because this practice does nothing more than defer the analysis of whether project runoff would result in pollutants, it cannot be relied upon to reduce impacts of the proposed Project.

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3. SEIR Fails to Provide Any Analysis of Project-Related Impacts Associated with Dewatering During Construction.

The City has standard practices addressing dewatering during construction that the SEIR fails to address. Dewatering activities can draw in contamination from outside areas such that testing and monitoring of the groundwater discharges may be required to ensure the discharge of clean water and the protection of the community from vapors or other health hazards. Additionally, testing for soils contamination prior to soil disturbance may also be appropriate. The SEIR fails to perform any of this analysis to determine whether dewatering activities would result in environmental impacts related to water quality and to public safety.

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J. The SEIR's Analysis of Project-Related Impacts on Utilities Is Incomplete.

The SEIR's evaluation of the Project's impacts on utilities and service systems suffers from the same narrow view taken to evaluate impacts discussed throughout this letter. For example, the SEIR concludes that the Project would have a less than significant impact on water supply, but it does so without evaluating the impacts associated with the massive enrollment increase. SEIR at 175 and 176. The SEIR therefore presents an artificially limited analysis.

The SEIR's evaluation of Project impacts on wastewater infrastructure serving the project area takes the same truncated approach and limits its review to the GSPP component of the Project. What analysis the SEIR does conduct related to wastewater collection and treatment is incomplete and inadequate. First, the SEIR fails to adequately describe the existing setting of the wastewater infrastructure in the vicinity of the GSPP project area. See, SEIR at 173 stating only that the Project would connect directly to the city's system via 6-inch lateral connections to sewer lines beneath La Loma Avenue and Hearst Avenue. The failure to describe the existing setting is problematic because this area of the city has aging infrastructure that is already suffering leaks and other problems. Personal Communication, C. Borg (consulting planner to the City) and T. Pham, Associate Civil Engineer, City of Berkeley, March 22, 2019. Adding additional connections to this already burdened infrastructure could result in significant impacts, as acknowledged by the SEIR. However, the University failed to consult with the city regarding the required connections and thus failed to describe the baseline conditions.

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Second, while the SEIR concludes that the project would result in significant impacts associated with the Project's contribution to high wet weather flows that would exceed allowable levels at the Wastewater Treatment Plant, the SEIR fails to

provide any information on the extent and severity of the impact. SEIR at 178 and 179. Merely stating that an impact will occur is insufficient; an EIR must also provide “information about how adverse the adverse impact will be.” *Santiago County Water District v. County of Orange* (1981) 118 Cal. App. 3d 818, 831. This information, of course, must be accurate and consist of more than mere conclusions or speculation. *Id.* The SEIR’s analysis of impacts to utilities and service systems fails to fulfill this mandate.

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K. The SEIR’s Analysis of Growth Inducing Impacts Is Incomplete and Flawed.

CEQA requires that an EIR include a “detailed statement” setting forth the growth-inducing impacts of a proposed project. § 21100(b)(5); *City of Antioch v. City Council of Pittsburg* (1986) 187 Cal. App. 3d 1325, 1337. The statement must “[d]iscuss the ways in which the proposed project could foster economic growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.” Guidelines § 15126.2(d). It must also discuss how the project “may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively” or “remove obstacles to population growth.” *Id.*

Here, the SEIR’s analysis of growth-inducing impacts is wholly inadequate. As with other issues, the document relies on speculation instead of evidence to support its conclusions. The SEIR’s conclusion that the Project will have no growth-inducing impacts is not supported by substantial evidence. The scope of the study area is too narrow to adequately assess the Project’s growth-related impacts. Although the SEIR does not explicitly describe the study area in which it analyzes the Project’s potential to induce growth, it appears to only analyze the Project’s growth-inducing effects on campus. SEIR at 186 (discussing how “it is anticipated that physical development to accommodate an increasing population of students, faculty, and staff would not exceed the development parameters assumed in the 2020 LRDP”).

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In conducting this narrow analysis, the SEIR ignores the fact that the University’s increased enrollment will necessitate development of housing in the City of Berkeley and other nearby communities. The SEIR provides no rationale for its limited analysis. Such “dismissive treatment of relocated growth pressures on [] outlying towns [] is inconsistent with a hard look at relocated or redirected growth . . .” *Senville v. Peters* (D. Vt. 2004) 327 F. Supp. 2d 335, 368. Indeed, the EIR’s failure to “discuss any development pressure on towns not directly adjacent to” the Project means that the City’s determination that the Project will not have significant impacts related to relocated growth is not “based upon reason,” and therefore violates CEQA. *Id.* (discussing parallel provisions under the National Environmental Protection Act). CEQA specifically requires an agency to assess all environmental impacts of a project, even if “the project’s effect on growth and housing will be felt outside of the project area.” *Napa Citizens for Honest Govt. v. Napa County Board of Supervisors*, 91 Cal. App. 4th 342, 369 (2001). As the

court in *Napa Citizens for Honest Government* stated: “the purpose of CEQA would be undermined if the appropriate governmental agencies went forward without an awareness of the effects a project will have on areas outside of the boundaries of the project area.” Id.

The proposed Project could induce growth or affect growth patterns in numerous areas other than the University campus property. For example, as discussed throughout this letter, the Project would increase pressure to develop property in the City of Berkeley and in other parts of the Bay Area, and therefore could induce growth there. The SEIR admits as much, stating that “most of the additional campus population would live in Berkeley or nearby parts of the Bay Area. SEIR at 150. However, it fails to evaluate impacts from this induced growth.

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Moreover, the SEIR fails to analyze the Project’s potential to induce growth in areas that are not immediately adjacent to campus. The SEIR is deficient because it does not describe whether property in Berkeley or other nearby jurisdictions is nearly built-out, and the extent to which the very large enrollment growth would induce growth in those areas.

In sum, in addition to considering the environmental impact from constructing housing on-campus as part of the GSPP component of the Project, the University must study the degree to which massive enrollment jump induces growth and displacement of residents in the city and how that growth could impact the environment, including transit facilities and vehicle miles traveled in the area. See CEQA Guidelines, § 15064.3(a) and Appendix G, Section XVII.a.hfg

L. The SEIR’s Cumulative Impacts Analysis Is Underinclusive and Legally Flawed.

An EIR must discuss significant “cumulative impacts.” CEQA Guidelines § 15130(a). “Cumulative impacts” are defined as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” CEQA Guidelines § 15355. “[I]ndividual effects may be changes resulting from a single project or a number of separate projects.” CEQA Guidelines § 15355(a). A legally adequate “cumulative impacts analysis” views a particular project over time and in conjunction with other related past, present, and reasonably foreseeable future projects whose impacts might compound or interrelate with those of the project at hand. “Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.” CEQA Guidelines § 15355(b). Cumulative impacts analysis is necessary because “environmental damage often occurs incrementally from a variety of small sources [that] appear insignificant when considered individually, but assume threatening dimensions when considered collectively with other sources with which they interact.” *Communities for a Better Env’t v. Cal. Res. Agency* (2002) 103 Cal.App.4th 98, 114.

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Here, the analysis of cumulative impacts in the SEIR is inadequate because the analysis is limited to the GSPP component of the Project. The SEIR thus fails to consider the impacts of the GSPP project in combination with the enrollment spike. As discussed throughout this letter, the massive enrollment increase will result in impacts beyond the campus boundary. Given the lack of housing opportunities for housing on campus, it stands to reason that a substantial number of students, staff and faculty will live, work, and recreate in the City. This increase in population will result in increased air emissions, increased noise, a substantial increase in the need for public services, and increased wear-and-tear to utilities, infrastructure, recreation facilities and other facilities (e.g., library services). Therefore, unless the SEIR is revised to incorporate a more inclusive approach, its analysis of cumulative impacts will remain deficient.

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Moreover, the list of reasonably foreseeable future projects considered in the SEIR appears to be underinclusive, especially in light of the potential geographic scope of certain potentially significant impacts. For instance, the SEIR fails to consider most of the projects currently under review by the City of Berkeley except for two (i.e., 2012 Berkeley Way and 1601 Oxford Street). In fact the City has recently approved or is currently reviewing more than two dozen projects that should have been considered in the cumulative impacts analysis. *See*, List of Larger/Complex Projects as of February 1, 2019, attached as Attachment E. Given that the increased enrollment is likely to result in impacts citywide (e.g., impacts to traffic, air quality, noise, public services, utilities and infrastructure, and recreation), the SEIR should have looked at cumulative impacts citywide.

M. The SEIR Fails to Consider Feasible Alternatives that Would Lessen Significant Impacts Associated with the Project.

The SEIR does not comply with the requirements of CEQA because it fails to undertake a legally sufficient study of alternatives to the Project. A proper analysis of alternatives is essential to comply with CEQA's mandate that, where feasible, significant environmental damage be avoided. Pub. Resources Code § 21002 (projects should not be approved if there are feasible alternatives that would substantially lessen environmental impacts); CEQA Guidelines §§ 15002(a)(3), 15021(a)(2), 15126(f). The primary purpose of CEQA's alternatives requirement is to explore options that will reduce or avoid adverse impacts on the environment. *Watsonville Pilots Assn. v. City of Watsonville* (2010) 183 Cal.App.4th 1059, 1089. Therefore, the discussion of alternatives must focus on project alternatives that are capable of avoiding or substantially lessening the significant effects of the project, even if such alternatives would impede to some degree the attainment of the project objectives or would be more costly. CEQA Guidelines § 15126.6(b); see also *Watsonville Pilots*, 183 Cal.App.4th at 1089 (“[T]he key to the selection of the range of alternatives is to identify alternatives that meet most of the project's objectives but have a reduced level of environmental impacts”).

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In addition, a “lead agency may not give a project’s purpose an artificially narrow definition,” to shape this determination but rather must “structure its EIR alternative analysis around a reasonable definition of underlying purpose and need.” *In re Bay-Delta etc.* (2008) 43 Cal.4th 1143, 1166. In particular, using overly narrow objectives to dismiss reasonable and feasible alternatives constitutes prejudicial error. See *North Coast Rivers Alliance v. Kawamura* (2015) 243 Cal.App.4th 647, 669-70 (where the lead agency’s overly narrow project purpose caused it to “dismiss[] out of hand” a relevant alternative, this error “infected the entire EIR”). The SEIR’s discussion of alternatives in the present case fails to live up to these standards.

As discussed throughout this letter, the SEIR’s failure to disclose the severity of the Project’s wide-ranging impacts or to accurately describe the Project necessarily distorts the document’s analysis of Project alternatives. As a result, the alternatives are evaluated against an inaccurate representation of the Project’s impacts. The University may have identified additional or different alternatives if the Project impacts had been properly analyzed and if the Project had been accurately described.

Moreover, without sufficient analysis of the underlying environmental impacts of the entire Project, the SEIR’s comparison of this Project to the identified alternatives is utterly meaningless and fails CEQA’s requirements. If, for example, the SEIR concluded that the Project would result in significant impacts related to population and housing as it should have, the SEIR would be required to evaluate an alternative that did not pose these risks of impact. These additional alternatives would necessarily include alternatives that minimized population growth and/or increased the amount of on-campus housing provided.

Similarly, if the SEIR concluded that the Project would result in significant impacts related to growth inducement, the SEIR would be required to evaluate an alternative that minimized that growth. The LRDP EIR analyzed such an alternative, taking into account projections of both growth in enrollment and growth in sponsored research. LRDP EIR at 5.1-3.

Here, the SEIR fails to consider any alternative that addresses the significant impacts associated with the massive enrollment increase component of the Project and the housing demands that increase generates. The SEIR should have analyzed an alternative that stabilizes enrollment at existing levels and includes a commitment by the University to build additional housing on campus. As the SEIR repeatedly asserts, the 2020 LRDP planned for the addition of 2,600 new beds on campus, but the University has only provided 1,119. SEIR at 151. This alternative should include a commitment to build out the housing planned for in the 2020 LRDP by 2023 to address the housing needs of the new students added to the Berkeley campus in recent years. Such an alternative would address many of the impacts discussed throughout this letter and could feasibly be accomplished given that the housing is already included in the LRDP. As the City has pointed out in previous correspondence, the University should especially focus

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on prioritizing creation of student housing through new construction projects on sites at Fulton/Bancroft, University/Oxford, Channing/Ellsworth and infill development at Unit 3. Development at these sites has the potential to yield the remaining 1,500 housing units identified in the 2020 LRDP. *See*, Letter from Berkeley City Council to Chancellor Christ dated June, 2018.

Under CEQA, an agency may not approve a proposed project if a feasible alternative exists that would meet most of the project's objectives and would diminish or avoid its significant environmental impacts. Pub. Res. Code § 21002; *Kings County Farm Bureau* (1990) 221 Cal.App.3d 692, 731. Given the extensive environmental impacts this Project will have, the consideration of alternatives will not be complete until an EIR presents decision-makers and the public with a rigorous, good-faith assessment of options that reduce the environmental consequences of the Project.


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V. Conclusion

For all these reasons, the City of Berkeley urges the University to revise and recirculate the environmental analysis for this project. Specifically, the University should break down the Project into its two component parts—the GSPP Project and Enrollment Project. For clarity, the City believes it would be best to analyze these two Projects in separate environmental documents. Because neither project is consistent with the LRDP, however, the University may not tier off of the 2020 LRDP EIR, but instead must prepare a subsequent EIR. This subsequent EIR must be circulated for public review and comment.

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Sincerely,



Timothy Burroughs
Director, Department of Planning & Development

List of Attachments:

Attachment A	Memorandum from Benjamin Sigman at Economic & Planning Systems ("EPS), Inc. to Jordan Klein, Economic Development Manager, Office of Economic Development, City of Berkeley, re: Preliminary Fiscal Impact Analysis of UC Berkeley in 2018, dated March 27, 2019.
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- Attachment B How Additional is the Clean Development Mechanism? Analysis of the application of current tools and proposed alternatives, Institute of Applied Ecology, March, 2016.
- Attachment C Carbon Credits Likely Worthless in Reducing Emissions, Inside Climate News, April 19, 2017.
- Attachment D CARB's 2017 Climate Change Scoping Plan.
- Attachment E City of Berkeley List of Larger/Complex Projects as of March 1, 2019.

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ATTACHMENTS

- Attachment A Memorandum from Benjamin Sigman at Economic & Planning Systems (“EPS), Inc. to Jordan Klein, Economic Development Manager, Office of Economic Development, City of Berkeley, re: Preliminary Fiscal Impact Analysis of UC Berkeley in 2018, dated March 27, 2019.
- Attachment B How Additional is the Clean Development Mechanism? Analysis of the application of current tools and proposed alternatives, Institute of Applied Ecology, March, 2016.
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DRAFT MEMORANDUM

To: Mr. Jordan Klein, Economic Development Manager, Office of Economic Development, City of Berkeley

From: Benjamin C. Sigman, Jason Moody, and Ashley Boots, Economic & Planning Systems, Inc.

Subject: Preliminary Fiscal Impact Analysis of UC Berkeley in 2018

Date: March 27, 2019

The Economics of Land Use



The City of Berkeley (City) has engaged Economic & Planning Systems (EPS) to analyze and document the economic and fiscal effects of the University of California, Berkeley (UC Berkeley). The EPS study ultimately will provide new data and analysis to inform City input to long-range campus planning and associated impact mitigations to be negotiated between the City and the University. While the EPS study will be developed throughout calendar year 2019, UC Berkeley recently released California Environmental Qual Act (CEQA) documentation that Amends the 2020 Long Range Development Plan (LRDP) Environmental Impact Report, and there is a near-term need to evaluate the current fiscal impact of UC Berkeley on the City.

The release of CEQA documents presents an opportunity for the City to provide comments and express concerns related to the University's recent growth. In this memorandum, EPS presents preliminary fiscal impact estimates to assist the City in developing comments on the University's CEQA document. The 2018 fiscal impact estimates reflect analytical methods established by the UC Berkeley Fiscal Impact Analysis conducted by EPS for the City in 2004 (**Appendix B**).

This memorandum describes EPS fiscal impact estimates from 2003 and updated estimates for 2018. To the extent possible, the 2018 estimates incorporate new City revenue and cost data, UC and City population counts, and consumer spending data, in combination with fiscal impact factors derived from EPS's prior analysis of the University's impact. While the 2018 fiscal impact estimates presented here are preliminary, and the outputs of EPS's ongoing comprehensive study surely will differ, the estimates presented in **Figure 1** offer a reasonable first look at UC Berkeley's annual impact on the City revenues and costs in 2018.

Economic & Planning Systems, Inc.
One Kaiser Plaza, Suite 1410
Oakland, CA 94612-3604
510.841.9190 tel
510.740.2080 fax

Oakland
Sacramento
Denver
Los Angeles

www.epsys.com

**Figure 1 Summary of UC Berkeley's Fiscal Impact on the City of Berkeley
(Nominal Dollars)**

Cost & Revenue Categories	2003	2018	2003 - 2018 Change	
			Percentage	Dollar Value
Annual Cost Estimates				
Fire/Emergency Services	\$5,760,000	\$9,936,000	73%	\$4,176,000
Police	\$2,984,000	\$6,746,000	126%	\$3,762,000
Public Works – Sewer/Stormwater	\$2,698,000	\$6,153,000	128%	\$3,455,000
Public Works – Transportation	\$1,132,000	\$2,621,000	132%	\$1,489,000
Parks & Recreation	\$583,000	\$1,041,000	79%	\$458,000
Planning	\$165,000	\$314,000	90%	\$149,000
Health and Human Services	\$153,000	\$204,000	<u>33%</u>	<u>\$51,000</u>
Total Cost	\$13,475,000	\$26,702,000	98%	\$13,227,000
Annual Revenue Estimates				
Sales Tax	\$1,315,000	\$2,843,000	116%	\$1,528,000
Vehicle License Revenue	\$314,000	\$470,000	50%	\$156,000
Gas Tas	\$472,000	\$313,000	-34%	-\$159,000
Settlement Agreement	<u>\$0</u>	<u>\$1,661,000</u>	<u>-</u>	<u>\$1,661,000</u>
Total Revenue	\$2,101,000	\$5,287,000	152%	\$3,186,000
Net Fiscal Impact	-\$11,374,000	-\$21,415,000	88%	-\$10,041,000
Percentage of Expenditure Budget	4.9%	5.0%		

Summary of Fiscal Impacts Results

This Fiscal Impact Analysis estimates costs incurred by and revenues generated for the City of Berkeley that are attributable to UC Berkeley. Costs result from demand for public services, with the analysis evaluating UC Berkeley's impact on major City departments. In cases where UC partially covers its service demands by providing its own set of services (e.g., campus police, onsite open space, and recreational facilities), the analysis considers net demand on City services. The analysis also evaluates revenue accruing to the City that is attributable to UC Berkeley, including sales tax and other tax and fee revenues, as well as payments made as part of a 2005 settlement agreement.¹ The key output of the Fiscal Impact Analysis is the net fiscal impact of UC Berkeley on the City, with estimates generated for 2003 and 2018 (2017-2018 academic year).

1. UC Berkeley's annual net fiscal impact on the City of Berkeley has increased from an estimated \$11 million in 2003 to over \$21 million in 2018.

The City provides a broad array of public services to all residents, businesses, and entities located within its bounds. UC Berkeley is both a major employer and provider of housing, and as such demands a variety of public services. At the same time, UC Berkeley is a tax-exempt entity and is not subject to many of the taxes and charges the City uses to fund its services. As a result, City revenues attributable to UC Berkeley are insufficient to fund services and infrastructure provided to the University. The estimated \$10 million increase in UC Berkeley's net fiscal impact since 2003 represents a rise of 88 percent over fifteen years. This cost increase is primarily driven by budget escalation, with the City's budget having risen 83 percent over the same time frame.² In addition, UC Berkeley's demand for services has grown relative to citywide demand, with the University's service population and calls for service now making up a greater share of the citywide totals. For example, calls for police service from within UC Berkeley and its environs increased from about 14 percent to 19 percent of the citywide total in 2003 and 2018, respectively.

2. Of the City departments, the Berkeley Fire Department is most significantly affected by service demands attributable to UC Berkeley.

The City of Berkeley's most substantial cost burden caused by UC Berkeley is the provision of fire and emergency services. While UC Berkeley has its own fire inspection and code enforcement personnel, it does not maintain a firefighting team or Emergency Medical Services (EMS) staff. As a result, the Berkeley Fire Department (BFD) provides the vast majority of fire and emergency medical protection for the campus. In 2018, this analysis estimates Fire Department costs at over \$9.9 million, approximately 37 percent of the total cost of service attributable to the University. Actual BFD costs could be even greater due to

¹ 2020 LRDP Litigation Settlement Agreement (2005) made among the University of California Berkeley and The Regents of the University of California and the City of Berkeley.

² This analysis relies on the City's budget trend to identify municipal cost increases. In addition to inflation, regulatory changes, unfunded mandates, service enhancements, and other factors can increase a city's budget. This preliminary analysis does not isolate the root causes of budget escalation.

the complex firefighting and EMS environment created by the high-density structures owned and operated by UC Berkeley.

3. Despite the negotiation of a 2005 settlement agreement that obligates UC Berkeley to make annual payments to the City, City revenues attributable to the University remain well below the service cost generated by the University.

UC does generate revenues to the City, including sales tax revenues and state-allocated revenues such as vehicle license fees and gasoline taxes. While sales tax revenues have grown over the past fifteen years, and the settlement agreement is a significant source of funding for the City, these revenue sources do not cover the full cost of service provision. The most significant source of revenue is sales tax revenue, estimated at about \$2.8 million in 2018. In addition, with escalation defined by the settlement agreement, UC Berkeley's (maximum) direct payments to the City have grown to about \$1.6 million.³ Together, these two sources of City funding comprise almost 85 percent of the City revenue attributable to the University.

Figure 1 summarizes EPS estimates of UC Berkeley's fiscal impact on the City of Berkeley in 2003 and 2018. Fiscal costs are detailed across the six City departments affected most significantly by the University.⁴ Public Works Department costs are separated into (1) transportation costs and (2) sewer/stormwater costs due to the unique estimating methods used for each. City revenues attributable to UC Berkeley include sales tax revenue, vehicle license fee revenue (a property tax allocation from the state since 2004), gas tax revenue, and monies paid by UC Berkeley to the City as required by a litigation settlement agreement.

Methodology and Assumptions

This analysis is based on data, assumptions, and calculations concerning the UC Berkeley population and associated facilities, UC Berkeley demand for City services and infrastructure, and the City of Berkeley's annual budget (all funds) and operating factors. This memorandum offers a high-level summary of analytical inputs and research methodology. The 2018 update estimates closely follow the analytical approach relied upon in the earlier 2004 study. **Appendix A** includes a summary of data, sources, and calculation methods employed to estimate the net fiscal impact of UC Berkeley on the City of Berkeley in 2003 and 2018. For additional information, **Appendix B** provides the 2004 EPS report which further details the methodological approach and assumptions.

³ The 2020 LRDP Litigation Settlement Agreement (2005) specifies maximum dollar amounts to paid by UC Berkeley to the City of Berkeley. This preliminary analysis has not confirmed actual payments received by the City.

⁴ To the extent that other departments are affected, the methodology is conservative (i.e., more likely to understate UC's impact on the City's budget).

Existing Conditions and Service Population

UC Berkeley estimates its population for the 2017-2018 school year was 40,955 students and 14,682 faculty and staff.⁵ The total population of the City of Berkeley was 121,874.⁶ The UC Berkeley student population count includes students who are residents of Berkeley as well as student who live elsewhere. This analysis estimates that approximately 25,000 UC students are Berkeley residents, almost one fifth of the City's population.⁷

The Fiscal Impact Analysis uses current population counts by demographic category (e.g., UC students living on campus, UC students living off-campus, faculty/staff, etc.) to estimate an updated UC Berkeley "service population." These estimates equate the total UC population to Berkeley full-time-resident equivalents, based on the amount of time each population segment spends on campus. Service population estimates are used to determine demand for City services attributable to UC Berkeley relative to citywide demand.

This analysis assumes that campus residents represent the same demand for services as a typical full-time Berkeley resident (a resident who lives and works in the City), while off-campus residents, faculty, and staff each represent one-half the demand of a full-time Berkeley resident (i.e., because about half their time is spent at and around the campus, their average service demand will be half). Similarly, Berkeley residents who work outside of the City are given half the weight of a full-time Berkeley resident, as are nonresidents who work in Berkeley but live elsewhere.

Figure 2 details service population estimates for 2003 and 2018. For 2018, recent data indicate the UC service population is about 34,178 as compared to the Citywide service population of 134,462. UC Berkeley's service population represents 25.4 percent of the Citywide total, up from 24.5 percent in 2003. These service population estimates are used to calculate the service demand for Fire Department costs and some Health and Human Service costs. A different service population methodology is used to calculate the service demand for City parks, as shown in **Figure 3**. This analysis finds that UC Berkeley park and recreation demand has risen from about 7.6 percent of the citywide total in 2003 to 8.4 percent of the citywide total in 2018.

⁵ Draft Supplemental EIR to the 2020 Long Range Development Plan Environmental Impact Report, February 2019 (Table 4 page 46).

⁶ Draft Supplemental EIR to the 2020 Long Range Development Plan Environmental Impact Report, February 2019 (page 151) and California Department of Finance 2018.

⁷ Proportion of students living in Berkeley assumed at 61 percent, based on correspondence with UC staff during the preparation of the 2003 Economic Impact Analysis (EPS 2004).

Figure 2 Service Population Calculations

	Population Counts		Service Population Weights	Service Population Counts	
	2003	2018		2003	2018
UC Service Population					
On-campus student residents ¹	11,600	12,719	1.0	11,600	12,719
Off-campus students ²	20,200	28,236	0.5	10,100	14,118
Faculty/Staff ³	<u>14,135</u>	<u>14,682</u>	0.5	<u>7,068</u>	<u>7,341</u>
Total	45,935	55,637		28,768	34,178
Citywide Population and Employment					
City residents not employed ⁴	51,676	62,374	1.0	51,676	62,374
City residents working in Berkeley ⁵	23,588	14,994	1.0	23,588	14,994
City residents working outside Berkeley ⁶	31,086	44,506	0.5	15,543	22,253
Non-Residents working in Berkeley ⁷	<u>53,612</u>	<u>69,682</u>	0.5	<u>26,806</u>	<u>34,841</u>
Total	159,962	191,556		117,613	134,462
UC Service Population % of Citywide				24.5%	25.4%

Footnotes pertain to 2018 data. For additional information, including 2003 data and sources, see **Appendix A**.

¹ EPS 2004 plus 1,119 beds (SEIR 2019)

² Total students (40,955 reported in SEIR) less on-campus student count

³ SEIR 2019

⁴ Derived from DOF E-5 population counts, EDD Labor Force Data, and US Census Bureau

⁵ Derived from DOF E-5 population counts, EDD Labor Force Data, and US Census Bureau

⁶ Derived from DOF E-5 population counts, EDD Labor Force Data, and US Census Bureau

⁷ Derived from DOF E-5 population counts, EDD Labor Force Data, and US Census Bureau

Figure 3 City Parks Service Population

	Population Counts		Service Population Weights	Service Population Counts	
	2003	2018		2003	2018
UC Service Population					
On-campus student residents ¹	11,600	12,719	1.0	11,600	12,719
Off-campus students ²	20,200	28,236	0.5	10,100	14,118
Total Students	31,800	40,955		21,700	26,837
UC City Park Users ³	10,494	13,515		7,161	8,856
Citywide Population and Employment					
Total Residents ⁴	106,350	121,874	1.0	106,350	121,874
UC Students Living In Berkeley ⁵	19,398	24,983	1.0	19,398	24,983
Resident Population Less UC Student City Residents	86,952	96,891	1.0	86,952	96,891
Total City Park Users ⁶	97,446	110,407		94,113	105,748
UC City Park Users % of Total City Park Users				7.6%	8.4%

Footnotes pertain to 2018 data. For additional information, including 2003 data and sources, see **Appendix A**.

¹ EPS 2004 plus 1,119 beds (SEIR 2019)

² Total students (40,955 reported in SEIR) less on-campus student count

³ 33% of UC student population

⁴ DOF E-5 population count and SEIR 2019

⁵ Proportion of students living in Berkeley assumed at 39 percent (UC Berkeley and EPS 2004)

⁶ "UC City Park Users" plus "Resident Population Less UC Student City Residents"

Cost Estimates

Six departments are believed to experience significant service costs attributable UC Berkeley. This section details data and assumptions relied upon to generate fiscal impact estimates. To estimate service costs, this analysis relies on the City's fiscal year 2018 expenditure budget for all funds. As shown in **Figure 4**, the City's all-funds expenditure budget has increased by 83 percent since 2003. Departments such as Public Works and Police have seen greater than average cost increases, with budget growth of 128 percent and 95 percent, respectively.

Figure 4 City of Berkeley Expenditure Budget for All Funds 2003 & 2018

Expenditure Category	FY2003 (Adopted)¹	FY2018 (Adopted)	2003-2018 Escalation
Mayor & Council	\$957,642	\$2,028,441	112%
Auditor	\$1,311,215	\$2,424,263	85%
Police Review Commission	\$333,533	\$722,180	117%
City Manager	\$4,288,514	\$6,637,466	55%
Office of Economic Development	\$2,513,363	\$5,626,805	124%
Information Technology	\$2,506,320	\$16,291,888	550%
City Attorney	\$3,240,132	\$4,343,771	34%
City Clerk	\$1,621,097	\$2,059,366	27%
Finance	\$8,171,568	\$7,727,093	-5%
Human Resources	\$2,154,784	\$3,810,616	77%
Health, Housing & Community Services ²	\$36,243,306	\$47,355,255	31%
Police	\$34,234,912	\$66,747,004	95%
Fire	\$23,864,525	\$39,091,308	64%
Public Works	\$66,298,006	\$151,198,065	128%
Parks, Recreation & Waterfront	\$17,429,639	\$28,271,481	62%
Planning	\$8,706,714	\$18,201,442	109%
Library	\$11,405,623	\$20,990,466	84%
Rent Board	\$2,669,431	\$5,525,740	107%
Non-Departmental	\$43,290,463	\$47,343,920	9%
Gross Appropriations	\$271,240,787	\$476,396,570	76%
Less: Dual Appropriations	-\$39,139,228	-\$25,589,992	-35%
Less: Revolving & Internal Service Funds		-\$26,216,532	
Net Expenditure	\$232,101,559	\$424,590,046	83%

¹ Reflects nominal dollars. Note there has been 36.4 percent inflation from 2003 - 2018 (Bureau of Labor Statistics, Consumer Price Index).

² Includes "Housing Department" Expenditure Budget from FY2003

Source: City of Berkeley FY 2002-2003 Biennial Budget Adopted and FY 2018 & FY 2019 Adopted Biennial Budget

Fire/Emergency Services

Fire Department costs are calculated using the department's budget, with costs attributable to UC Berkeley determined based on the University's service population. With a department budget of \$39,091,000, and a UC Berkeley service population equal to 25.4 percent of the citywide total, the analysis estimates UC Berkeley cost the City's fire department about \$9,936,000 in 2018. While UC Berkeley has its own fire inspection and code enforcement personnel, it does not maintain a firefighting or Emergency Medical Services (EMS) staff. As a result, BFD provides the vast majority of fire and emergency medical protection for the campus. The 2018 Fire Department cost estimate is approximately 37 percent of the total cost of service attributable to the University.

Police Services

Calculating service costs for the Berkeley Police Department relies on a budget allocation estimate and an additional cost estimate associated with providing services during "civil unrest" (i.e., protest) events. The budget allocation estimate relies on a calls for service (CFS)-based budget allocation. The Department's 2018 budget was \$66,747,000. The portion of this cost that is attributable to UC Berkeley reflects calls for service in the University's Clery Area relative to the citywide total. From mid-2017 through mid-2018, Clery area calls constituted about 19 percent of total citywide calls.⁸ Because some crime and calls from this area are not attributable to UC Berkeley, the analysis applies a 50 percent downward adjustment to account for non-UC-related CFS. Based on these calculations, the analysis estimates calls-based BPD costs at about \$6,453,000. Additionally, civil unrest cost estimates from the 2003 study, adjusted upward for BPD budget escalation, indicate an additional \$292,000 in cost. Combining these estimates, the Police Department total is estimated at \$6,746,000.⁹

Public Works Services and Infrastructure

Sewer/Stormwater

The analysis derives sewer/stormwater costs from four categories, including avoided sewer services charges, sewer hookup fees, clean storm water fees, and solid waste cost estimates. Based on the department's budget escalation between 2003 and 2018, costs are up approximately 128 percent. Reflective of this cost escalation, 2018 sewer service charges are calculated at \$4,552,000, sewer hook up fees are \$1,177,000, clean storm water fees are \$267,000, and solid waste estimates are \$157,000. These four categories combined result in a total cost of \$6,153,000.

Public Works – Transportation

The analysis derives transportation costs from four categories, including costs for citywide street improvements, campus-abutting transportation improvements, signalization, and transportation demand management (TDM). Street improvement cost estimates reflect a budget allocation that relies on UC's "trip ends" (i.e., in-commuting) relative to the citywide total. Using Public Works Department budget escalation and the trip-end share from the 2003 study, the 2018 cost

⁸ The Clery area is UC Berkeley crime reporting geography, based on Clery Act requirements. Data provided to EPS by BPD.

⁹ City Police costs have grown in excess of budget escalation due to UC Berkeley's higher share of citywide Calls for Service, as compared with 2003.

estimate is \$1,723,000.¹⁰ For UC-abutting street, sidewalk, and street light cost estimates, the escalated cost estimate is \$514,000. For both signalization and TDM costs, costs also are escalated to 2018 to \$53,000 and \$332,000, respectively.¹¹ Combining the four categories totals to a transportation-related cost of \$2,621,000.

Parks & Recreation

The analysis calculates City parks and recreation costs using an adjusted service population-based budget allocation.¹² The 2003 department budget for selected costs (e.g., landscape services and building operations and maintenance) excluding all City marina costs is escalated by 62 percent, the Department's budget trend between 2003 and 2018. Relying on the 2003 service population methodology, which assumes 67 percent of UC student parks and recreation demand is satisfied by University facilities, the updated UC Berkeley service population is calculated to be 8.4 percent of the citywide total. The 2018 apportionment of escalated costs results in a 2018 department cost estimate of about \$1,041,000.

Planning

Planning Department costs are calculated in two categories, including staff time processing UC Berkeley projects and costs associated with the City's role overseeing UC Berkeley's hazardous materials activity. Staff time costs are estimated using the City's 2018 gross compensation estimate of \$234,000 for a full-time senior staff member to work as a UC liaison and conduct environmental reviews. The second cost category reflects the City's role as the Certified Unified Program Agency (CUPA) / Hazardous Materials Management Program administrator. In 1997 the City received \$60,000 for this work. After a 56.5 percent CPI-based inflationary adjustment, and a downward adjustment of 15 percent to account for costs related to Lawrence Berkeley National Lab (LBNL), the resulting 2018 estimate for CUPA costs is about \$80,000. The two Planning Department cost categories total \$314,000 in 2018.

Health and Human Services (HHS)

HHS has two primary categories of cost attributable to UC Berkeley, including communicable disease control and environmental health costs. Communicable disease control costs are estimated using a service population-based budget allocation. Escalated to 2018 and multiplied by UC Berkeley's share of citywide service population, the analysis estimates a 2018 cost of \$160,000. For environmental health costs, HHS Environmental Health Division staff time attributable to the UC in 2003 is multiplied by the Department's 2018 hourly billing rates, generating an estimate of \$43,000. The total HHS department costs estimate comes to \$204,000.

Revenue Estimates

City revenues attributable to UC Berkeley offsets some of the fiscal costs generated by the University. This section estimates UC Berkeley contributions to the City's fiscal health, including

¹⁰ Updated citywide trip-end data for 2018 were not available for this preliminary analysis.

¹¹ TDM costs had been adjusted downward in 2003 to reflect potential future population trends. This adjustment is not included in the 2018 estimate, resulting in escalation in excess of the department budget.

¹² **Figure 3** presents Park and Recreation Service Population calculations.

sales tax revenues, vehicle license fee revenues, gas tax revenues, and settlement agreement funds.

Sales Tax

Sales tax revenues are calculated by estimating student, faculty, staff, and UC taxable spending, and applying the City of Berkeley's local tax rate. The analysis establishes student spending assumptions from UC Berkeley's own student budgets.¹³ Faculty and staff spending estimates are based on the well-regarded ICSC Office Worker Survey.¹⁴ The University's direct spending in Berkeley is escalated from 2001 estimates reported by the Sedway Group, based on the University's overall budget escalation since then.¹⁵ Applying Berkeley's local 1.0 percent tax rate to estimated taxable spending figures results in a total sales tax revenue estimate of \$2,843,000 in 2018.

Vehicle License Revenue

The City of Berkeley receives Property Tax in Lieu of Vehicle License Fee (VLF) revenues from the State of California. The VLF is a charge imposed by the state on the ownership of a registered vehicle. Cities receive additional property tax to replace VLF revenue that was eliminated when the state permanently reduced the VLF in 2004. Property tax in lieu of VLF grows proportionally with the assessed valuation of taxable property. Since UC Berkeley has not contributed to assessed value growth in Berkeley due to its tax-exempt status, this analysis assumes that the VLF attributable to UC Berkeley has not increased since 2003. However, a downward adjustment associated with VLF revenue uncertainty in 2003 has been removed from the 2018 calculation. Using the 2003 annual City revenue estimate, excluding the 33 percent downward adjustment for anticipated revenue decreases at that time, results in a 2018 vehicle license revenue estimate of \$470,000.

Gas Tax

The gas tax is calculated through a population-based revenue allocation. The analysis relies on the state's reported highway users tax apportionment for the City of Berkeley in FY2017-18.¹⁶ This revenue, about \$3.0 million, is allocated to UC Berkeley based on the University's fair share contribution to the local resident population, with the number of on-campus residents estimated at 10.4 percent of the City's total population. The calculation indicates that approximately \$313,000 in gas tax revenue can be attributed to UC Berkeley.

Settlement Agreement

The litigation settlement agreement established between the UC and City in 2005 outlined annual payments of \$1,000,000 to the City and \$200,000 to a joint account. Escalated at 3.0 percent annually (as allowed by the agreement) for 11 years, this analysis calculates FY2018 payment

¹³ <https://financialaid.berkeley.edu/cost-attendance>

¹⁴ Office-Worker Retail Spending in a Digital Age, Michael P. Niemira and John Connolly ICSC Research Department, International Council of Shopping Centers (2012).

¹⁵ Building the Bay Area's Future: A Study of the Economic Impact of the University of California, Berkeley, Prepared for UC Berkeley by Sedway Group (2001)

¹⁶ Apportionment Summary, Highway Users Tax Account, July 1, 2017 through June 30, 2018, State of California Controllers Office (https://sco.ca.gov/Files-AUD/streets_apportionment_1718.pdf).

potential at \$1,384,233 to the City and \$276,846 to the joint account (i.e., the Chancellor's Community Partnership Fund).¹⁷ In total, UC Berkeley supplementary settlement agreement funds accruing to the City of Berkeley are estimated at approximately \$1,661,000 in 2018.

¹⁷ The cited settlement agreement funds are a maximum based on the agreement. Further research may reveal that the City has not received full funding.



APPENDIX A: Summary Table Set

Summary of 2003 Annual Cost Estimates

Cost Source	Methodology	2003 Data, Assumptions & Sources	Estimation / Allocation Factors	Municipal Cost Estimate
Police	CFS ¹ -Based Budget Allocation [50% downward adjustment for Non-UC CFS]	BPD ² Budget = \$39,579,000 <i>City of Berkeley</i>	UC CLERY Area CFS = 26,055 Citywide CFS = 181,930 <i>BPD and EPS (2004)</i>	\$2,834,000
			CFS Allocation Factor = 14.3%	
	Civil Unrest Ongoing Costs	<i>BPD Estimate</i>		<u>\$150,000</u>
				\$2,984,000
Fire	Fire Department Service Population-Based Budget Allocation	BFD ³ Budget = \$23,551,000 <i>City of Berkeley</i>	UC Service Population = 28,768 Citywide Service Population = 117,613 <i>Various sources and EPS (2004)</i>	\$5,760,000
				Service Population Ratio = 24.5%
Parks and Recreation	Parks and Recreation Department Service Population-Based Budget Allocation [67% downward adjustment for UC open space]	Budget for Selected Costs [excludes marina] = \$7,667,000 <i>City of Berkeley</i>	UC Service Population = 21,700 Citywide Service Population = 94,113 <i>Various sources and EPS (2004)</i>	\$583,000
				Service Population Ratio = 23.1%
Public Works/ Transportation	Trip End-Based Street Improvement Budget Allocation	Budget for Citywide Street Improvement = \$4,900,000 <i>City of Berkeley</i>	UC Auto Commute Trip Ends = 9,350 Citywide Commute Trip Ends = 60,693 <i>City of Berkeley and EPS (2004)</i>	\$755,000
			Trip End Ratio = 15.4%	
	UC-Abutting Street, Sidewalk, and Street Light Cost Estimate	Streetscape Cost Estimate <i>City of Berkeley</i>		\$225,000
	Trip End-Based Signalization Budget Allocation	Budget for Citywide Signal Installation = \$150,000 <i>City of Berkeley</i>	Trip End Ratio = 15.4%	\$23,000
				Budget for Citywide TDM Improvements = \$2,241,000 (Annualized Contribution = \$202,000) Budget for Citywide TDM Administration = \$744,000 <i>City of Berkeley and EPS (2004)</i>
				Trip End Ratio = 15.4%
				<u>\$128,000</u>
				\$1,132,000

Summary of 2003 Annual Cost Estimates (Continued)

Public Works/ WWSW	Avoided Sewer Service Charges	Avoided Sewer Rate Charge Estimate <i>Brown and Caldwell and EPS (2004)</i>		\$1,996,000
	Avoided Sewer Hook Up Fees	Avoided Sewer Hook Up Fee Estimate <i>Brown and Caldwell and EPS (2004)</i>		\$516,000
	Avoided Clean Storm Water Fees	Avoided Clean Storm Water Fees <i>Brown and Caldwell Report and EPS (2004)</i>		\$117,000
	Solid Waste Cost Estimate	UC & Neighborhood Clean Up Cost Estimate <i>City of Berkeley</i>		<u>\$69,000</u>
				\$2,698,000
Planning	Full-Time Senior Staff Member (UC Liason and Enviro Reviews) Cost Estimate	Gross Compensation Estimate <i>City of Berkeley</i>		\$100,000
	CUPA Agency (Hazardous Waste) Cost Estimate	Now Discontinued UC Payments to City in 1997 = \$60,000 <i>City of Berkeley</i>	Inflationary Adjustment (1997-2003) +26.7% LBNL ⁵ Adjustment -15%	<u>\$65,000</u>
				\$165,000
Health and Human Services	HHS Service Population-Based Communicable Disease Control Budget Allocation	Citywide Communicable Disease Control Budget = \$500,000 <i>City of Berkeley</i>	UC Service Population = 28,768 Citywide Service Population = 117,613 <i>Various sources and EPS (2004)</i>	\$122,000
	HHS Environmental Health Division Staff Time at Standard Hourly Rates	Department Billing Rate = \$120	Service Population Ratio = 24.5% Staff Hours Attributable to UC = 255	<u>\$31,000</u>
				\$153,000
Total				\$13,475,000

(1) Calls for Service
(2) Berkeley Police Department
(3) Berkeley Fire Department
(4) Transportation Demand Management
(5) Lawrence Berkeley National Laboratory

Summary of 2018 Annual Cost Estimates

Cost Source	Methodology	2018 Data, Assumptions & Sources	Estimation / Allocation Factors	Municipal Cost Estimate
Police	CFS ¹ -Based Budget Allocation [50% downward adjustment for Non-UC CFS]	BPD ² Budget = \$66,747,000 <i>City of Berkeley FY2018 Adopted Budget</i>	Allocation Factor = 19.3% <i>BPD and EPS</i>	\$6,453,000
	Civil Unrest Ongoing Costs	BPD Estimate = \$150,000 (2003\$) BPD Budget Escalation 2003-2018 = 95% 2018 Estimate = \$292,000 (2018\$) <i>BPD and EPS</i>		<u>\$292,000</u>
				\$6,746,000
Fire	Fire Department Service Population-Based Budget Allocation	BFD ³ Budget = \$39,091,000 <i>City of Berkeley FY2018 Adopted Budget</i>	UC Service Population = 34,178 Citywide Service Population = 134,462 <i>Various sources and EPS</i>	\$9,936,000
			Service Population Ratio = 25.4%	
Parks and Recreation	Parks and Recreation Department Service Population-Based Budget Allocation [67% downward adjustment for UC open space]	Budget for Selected Costs [excludes marina] = \$7,667,000 (2003\$) Parks and Recreation Budget Escalation 2003-2018 = 62% 2018 Estimate = \$12,436,000 <i>City of Berkeley and EPS</i>	UC Service Population = 26,800 Citywide Service Population = 105,700 <i>Various sources and EPS</i>	\$1,041,000
			Service Population Ratio = 25.4%	

Summary of 2018 Annual Cost Estimates (Continued)

Public Works/ Transportation	Trip End-Based Street Improvement Budget Allocation	Budget for Citywide Street Improvement = \$4,900,000 Public Works Budget Escalation 2003-2018 = 128% 2018 Estimate = \$11,182,000 <i>City of Berkeley and EPS</i>	Trip End Ratio = 15.4% <i>City of Berkeley and EPS (2004)</i>	\$1,723,000
	UC-Abutting Street, Sidewalk, and Street Light Cost Estimate	Streetscape Cost Estimate = \$225,000 (2003\$) Public Works Budget Escalation 2003-2018 = 128% 2018 Estimate = \$514,000 <i>City of Berkeley</i>		\$514,000
	Trip End-Based Signalization Budget Allocation	Budget for Citywide Signal Installation = \$150,000 Public Works Budget Escalation 2003-2018 = 128% 2018 Estimate = \$342,000 <i>City of Berkeley</i>	Trip End Ratio = 15.4% <i>City of Berkeley and EPS (2004)</i>	\$53,000
	Trip Ends-Based TDM Budget ⁴	Budget for Citywide TDM Improvements Annualized Contribution = \$202,000 (2003\$) Public Works Budget Escalation 2003-2018 = 128% Budget for Citywide TDM Administration = \$744,000 <i>City of Berkeley and EPS (2004)</i>	Trip End Ratio = 15.4% <i>City of Berkeley and EPS (2004)</i>	\$332,000
				\$2,621,000
Public Works/ WWSW	Avoided Sewer Service Charges	Avoided Sewer Rate Charge Cost Estimate = \$1,996,000 (2003\$) Public Works Budget Escalation 2003-2018 = 128% 2018 Estimate = \$4,552,000 <i>Brown and Caldwell and EPS</i>		\$4,552,000
	Avoided Sewer Hook Up Fees	Avoided Sewer Hook Up Fee Cost Estimate = \$516,000 (2003\$) Public Works Budget Escalation 2003-2018 = 128% 2018 Estimate = \$1,177,000 <i>Brown and Caldwell and EPS</i>		\$1,177,000
	Avoided Clean Storm Water Fees	Avoided Clean Storm Water Fees Cost Estimate = \$117,000 (2003\$) Public Works Budget Escalation 2003-2018 = 128% 2018 Estimate = \$267,000 <i>Brown and Caldwell and EPS</i>		\$267,000
	Solid Waste Cost Estimate	UC & Neighborhood Clean Up Cost Estimate = \$69,000 (2003\$) Public Works Budget Escalation 2003-2018 = 128% 2018 Estimate = \$157,000 <i>City of Berkeley and EPS</i>		<u>\$157,000</u>
				\$6,153,000

Summary of 2018 Annual Cost Estimates (Continued)

Planning	Full-Time Senior Staff Member (UC Liason and Enviro Reviews) Cost Estimate	Gross Compensation 2018 Estimate <i>City of Berkeley</i>		\$234,000
	CUPA Agency (Hazardous Waste) Cost Estimate	Now Discontinued UC Payments to City in 1997 = \$60,000 <i>City of Berkeley</i>	CPI Inflationary Adjustment (1997-2018) +56.5% LBNL ⁵ Adjustment -15%	<u>\$80,000</u>
				\$314,000
Health and Human Services	HHS Service Population-Based Communicable Disease Control Budget Allocation	Citywide Communicable Disease Control 2018 Budget = \$631,240 <i>City of Berkeley 2018 Data</i>	UC Service Population = 34,178 Citywide Service Population = 134,462 <i>Various sources and EPS</i>	\$160,000
			Service Population Ratio = 25.4%	
	HHS Environmental Health Division Staff Time at Standard Hourly Rates	Environmental Health Division Cost Estimate = \$31,000 (2003\$) HHS Billing Rate Escalation 2003-2018 = 42% <i>City of Berkeley and EPS</i> 2018 Estimate = \$43,000		<u>\$43,000</u>
				\$204,000
Total				\$26,702,000

- (1) Calls for Service
- (2) Berkeley Police Department
- (3) Berkeley Fire Department
- (4) Transportation Demand Management
- (5) Lawrence Berkeley National Laboratory

Summary of 2003 Annual Revenue Estimates

Revenue Source	Methodology	2003 Data, Assumptions & Sources	Estimation / Allocation Factors	Tax Revenue Estimate
Local Sales Tax	Student, Faculty, Staff, & UC Taxable Spending x Berkeley Local Tax Rate	On-Campus Student Taxable Spending = \$2,060/yr. Off-Campus Student Taxable Spending = \$1,030/yr. <i>Sedway (2001) and EPS (2004)</i>		
		Faculty & Staff Taxable Spending = \$2,000/yr. <i>ICSC Office Worker Survey</i>	11,600 On-Campus Students 20,200 Off-Campus Students 14,135 Faculty & Staff <i>UC Berkeley and EPS (2004)</i>	\$1,315,000
		UC Local Taxable Spending = \$58.5 million <i>Sedway (2001) and EPS (2004)</i>		
		Local Tax Rate = 1%		
Vehicle License Fee	On-Campus Resident Population-Based Revenue Allocation [33% downward adjustment for anticipated revenue decrease]	Annual City Revenue = \$4,306,748 <i>EPS (2004)</i>	On-Campus Resident Population = 11,600 City Population = 106,350 Allocation Factor = 10.9% <i>EPS (2004)</i>	\$314,000
Gas Tax	On-Campus Resident Population-Based Revenue Allocation	Annual City Revenue = \$4,331,060 <i>EPS (2004)</i>	On-Campus Resident Population = 11,600 City Population = 106,350 Allocation Factor = 10.9% <i>EPS (2004)</i>	\$472,000
Total				\$2,101,000

Summary of 2018 Annual Revenue Estimates

Revenue Source	Methodology	2018 Data, Assumptions & Sources	Estimation / Allocation Factors	Tax Revenue Estimate
Local Sales Tax	Student, Faculty, Staff, & UC Taxable Spending x Berkeley Local Tax Rate	On-Campus Student Taxable Spending = \$4,400/yr. Off-Campus Student Taxable Spending = \$2,200/yr. <i>UC Berkeley Student Budgets</i>		
		Faculty & Staff Taxable Spending = \$4,900/yr. <i>ICSC Office Worker Survey</i>	12,719 On-Campus Students 28,236 Off-Campus Students 14,682 Faculty & Staff <i>UC Berkeley SEIR and EPS (2004)</i>	\$2,843,000
		UC Local Taxable Spending = \$94.3 million <i>Sedway (2001) and EPS Escalated Estimate</i>		
		Local Tax Rate = 1%		
Vehicle License Fee	2018 Revenue estimate based on 2003 [excludes adjustment for anticipated revenue decrease]	2003 Annual City Revenue = \$4,306,748 2003 UC Share = \$470,000 [before adjustment] <i>EPS (2004)</i>	Since 2004-5 VLF revenue has escalated based on Assessed Value	\$470,000
			On-Campus Resident Population = 12,719 <i>UC Berkeley SEIR and EPS (2004)</i>	
Gas Tax	Population-Based Revenue Allocation	2018 Annual City Revenue = \$2,997,226 <i>State of California Comptroller's Office</i>	City Population = 121,874 <i>State of California Department of Finance</i>	\$313,000
Total			Allocation Factor = 10.4%	\$3,626,000



APPENDIX B:

2004 UC Berkeley Fiscal Impact Analysis



Economic &
Planning Systems

Real Estate Economics

Regional Economics

Public Finance

Land Use Policy

FINAL REPORT

UC BERKELEY FISCAL IMPACT ANALYSIS

Prepared for:

City of Berkeley

Prepared by:

Economic & Planning Systems, Inc.

July 2004

EPS #13009

BERKELEY
2501 Ninth St., Suite 200
Berkeley, CA 94710-2515
www.epsys.com

Phone: 510-841-9190
Fax: 510-841-9208



SACRAMENTO
Phone: 916-649-8010
Fax: 916-649-2070

DENVER
Phone: 303-623-3557
Fax: 303-623-9049

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I. INTRODUCTION AND RESULTS

INTRODUCTION

Economic & Planning Systems, Inc. (EPS) has been retained by the City of Berkeley (City) to provide information and analysis concerning the likely fiscal (public services) impacts of the University of California at Berkeley's (UC) new 2020 Long Range Development Plan (2020 LRDP). The analysis is designed to support discussions with UC on fair compensation/ mitigation payments.

The 2020 LRDP sets out UC's plans for growth and development between 2005 and 2020. A similar fiscal impact study was commissioned by the City in 1989 to evaluate the impacts of the prior LRDP that covered the period 1990 to 2005 (Economic & Planning Systems, Inc., 1989, *Fiscal Impacts of the University of California at Berkeley Long Range Development Plan upon City of Berkeley* (1989 Fiscal Report)). Negotiations with UC at that time resulted in a mitigation agreement (*Mitigation Implementation Agreement by and between the City of Berkeley and the Regents of the University of California*, July 26, 1990 (1990 Mitigation Agreement)) that laid out a series of UC payments to the City to cover its fiscal impacts. These payments, which generally fall below the actual impact of UC as estimated in the 1989 Report, are due to expire in 2005, and a new mitigation agreement has yet to be established.

The fiscal impacts considered cover a broad range of the public services provided by the City, including public safety, sewer and storm drain, and transportation services among others. Impacts associated with infrastructure, capital facilities, and major equipment were considered (e.g. major road improvements, new fire equipment), as well as the on-going impacts of providing public services, including personnel costs, supplies, and equipment. As explained below, only the direct effects of UC population and facilities are considered. Secondary effects, both positive and negative, are highly speculative and are not evaluated in this analysis.

The primary purpose of this Report was to evaluate the fiscal impacts of the 2020 LRDP. However, in the course of doing so, the methodology developed also revealed the existing fiscal impact of UC. These impacts are also reported. The key results of the Report are below.

SUMMARY OF FISCAL IMPACT RESULTS

1. UC has a significant fiscal impact on the City of Berkeley.

The City provides a broad array of public services to all residents, businesses, and entities located within its bounds. UC is both a major employer and provider of housing, and as such demands a broad array of services. At the same time, UC, as a tax-exempt entity, is not subject to many of the taxes and charges the City uses to ensure that development pays its fair share of public services. As a result, UC does not pay its own way, and this fiscal deficit means that the City is required to reduce the overall level of its services citywide or fund services to UC using revenues from other sources.

2. UC impacts include the on-going and capital costs associated with service provision.

UC fiscal impacts include the cost of providing capital facilities, infrastructure, and major equipment to serve UC – the “capital” side of the fiscal equation. These capital expenditures tend to require large periodic investments. UC fiscal impacts also include the costs of personnel, supplies, and smaller equipment associated with service provision – the “on-going” side of the equation. These are on-going costs that are borne by the City each year.

3. UC’s tax exempt status means that it does not automatically pay its own way.

As a State entity, UC is exempt from the payment of a large suite of local government charges, including property taxes, assessments, and other special taxes. These revenues fund a significant proportion of the City’s General Fund expenditures as well as a number of specific services. UC does generate revenues to the City, including sales tax revenues, as well as revenues tied to a City’s population count, such as auto in-lieu fees and gas taxes. The revenues do not, however, come close to covering the full costs of service provision.

4. Mitigation measures established in association with the last LRDP (effective from 1990 to 2005) made an important contribution to the funding of City public services, but fell well short of covering UC’s full fiscal impact.

The 1990 Mitigation Agreement between the City and UC provided a good starting point for mitigation/ compensation payments from UC to the City. Payments included UC contributions towards major fire equipment, sewer operations and capital costs, and stormwater services. At their peak, these payments resulted in an annual payment of \$779,000 in 1998 (the average payment between 1990 and 2002 was \$580,000 in nominal dollars). Even at the peak, these payments did not come close to covering the full cost impacts of UC as quantified in the 1989 Fiscal Report.

5. Several of these mitigation payments have already ended, others expire by 2005/6 and no new mitigation measures are in place.

Many of the UC mitigation payments under the 1990 Mitigation Agreement have ceased, and most others are due to expire in 2005/6 at the end of the term of the prior LRDP. The 2020 LRDP will become effective in 2005/6 and last for fifteen years through 2020/21. No new compensation/ mitigation measures are in place at this time.

6. The 2020 LRDP calls for the addition of 2,600 new beds on-campus, 2.2 million square feet of additional facilities, both on and off campus, and 2,300 parking spaces. It also projects the addition of 1,650 new students and 3,670 new faculty, academic and non-academic staff, visitors, and vendors (faculty/ staff).

The 2020 LRDP envisions a major expansion of UC. The number of students is expected to increase by 5.2 percent, the number of faculty/ staff by 26.0 percent, the number of beds provided by 22.4 percent, and the amount of academic and support space by 18.2 percent. **Table 1** summarizes these changes:

Table 1
Summary of Proposed UC Growth under 2020 LRDP
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020	Percent Increase
Number of Students	31,800	1,650	33,450	5.2 percent
Number of Beds	11,600	2,600	14,200	22.4 percent
Faculty/ Staff (1)	14,135	3,670	17,805	26.0 percent
Academic & Support Space	12.1 million	2.2 million	14.3 million	18.2 percent
Parking Spaces	7,600	2,300	9,900	30.3 percent

(1) Includes new faculty, academic and non-academic staff, visitors and vendors.

7. The annual, increase in public services costs associated with the 2020 LRDP is estimated at about \$1.95 million, including \$1.1 million in on-going costs, \$425,000 in capital costs, and \$425,000 in sewer/ stormwater costs.

The 2020 LRDP is expected to have impacts across most City departments. This Report focused on the seven departments where impacts are expected to be the most significant. It also assumed that current service standards would be adequate over the next fifteen years. The estimated additional public service cost impacts resulting from the 2020 LRDP at its buildout by cost category are presented below in 2003 dollars (see **Table 2a**).

Table 2a
Summary of Annual Cost Impacts of 2020 LRDP by Department/ Category
(2003 Dollars)
UC Berkeley Fiscal Impact Analysis

Department	On-Going	Capital (1)	Sewer/ (2) Stormwater	Total
Fire/ Emergency Services	\$562,000	\$230,000	--	\$793,000
Police	\$387,000	\$10,000	--	\$398,000
Public Works - Sewer/ Stormwater	--	--	\$424,000	\$424,000
Public Works/ Transportation (1)	\$56,000	\$171,000	--	\$227,000
Parks & Recreation	\$45,000	\$12,000	--	\$57,000
Planning	\$38,000	\$0	--	\$38,000
Health & Human Services	\$22,000	\$0	--	\$22,000
Total	\$1,111,000	\$423,000	\$424,000	\$1,959,000

(1) Capital costs include facilities, vehicles, and major equipment.

(2) The sewer/ stormwater estimates are from the B&C Report. They are separated from the other on-going/ capital costs for presentation purposes.

8. The current annual cost of providing these same public services to the existing UC is \$13.5 million, including \$8.1 million in on-going costs, \$2.7 million in capital costs, and \$2.7 million in sewer/ stormwater costs.

As part of this analysis, the cost of providing services to UC at the current time was estimated. The estimated annual cost impact of providing these services is estimated at \$13.5 million, including \$2.7 million in capital costs, \$8.1 in on-going costs, and \$2.7 million in sewer/ stormwater costs. The current public service cost impacts of UC by cost category are presented below (see **Table 2b**).

Table 2b
Summary of Existing Annual Cost Impacts of UC by Department/ Category
(2003 Dollars)
UC Berkeley Fiscal Impact Analysis

Department	On-Going	Capital (1)	Sewer/ (2) Stormwater	Total
Fire/ Emergency Services	\$4,087,000	\$1,673,000	--	\$5,760,000
Police	\$2,910,000	\$74,000	--	\$2,984,000
Public Works - Sewer/Stormwater	--	--	\$2,698,000	\$2,698,000
Public Works/ Transportation	\$326,000	\$806,000	--	\$1,132,000
Parks & Recreation	\$460,000	\$123,000	--	\$583,000
Planning	\$165,000	\$0	--	\$165,000
Health & Human Services	\$153,000	\$0	--	\$153,000
Total	\$8,101,000	\$2,676,000	\$2,698,000	\$13,475,000

(1) Capital costs include facilities, vehicles, and major equipment.

(2) The sewer/ stormwater estimates are from the B&C Report. They are separated from the other on-going/ capital costs for presentation purposes.

9. The combined net annual fiscal impact of providing public services necessary to accommodate both the existing UC community as well as growth projected from the 2020 LRDP is estimated at \$13.0 million in 2003 dollar terms. This net fiscal impact estimate accounts for about \$2.5 million in tax and fee revenue generated by the UC and its associated public service population.

The total costs of providing public services necessary to accommodate the existing UC community and its public service population as well as growth in the UC community as projected in the 2020 LRDP is estimated at \$15.4 million, which includes \$9.2 million in on-going operation and maintenance costs, \$3.15 million in capital costs, and \$3.15 million in sewer/stormwater costs. However, the UC is also estimated to generate approximately \$2.5 million a year in revenues, which includes \$2.1 million from the existing public service population and an additional \$400,000 associated with 2020 LRDP growth (see **Table 3**). The primary revenues generated by the UC include sales tax, auto in-lieu fee, and gas tax. The difference between total costs of \$15.4 and total revenues of \$2.5 million, or \$12.9 million, represents the net fiscal impact of the UC and its public service population through build-out of the LRDP in 2020.

Table 3
Net Annual Fiscal Impact (2003\$\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
Annual Revenues	\$2,100,000	\$400,000	\$2,500,000
Annual Costs			
Sewer/Stormwater	\$2,700,000	\$425,000	\$3,150,000
On-going	\$8,100,000	\$1,100,000	\$9,200,000
Capital	<u>\$2,700,000</u>	<u>\$425,000</u>	<u>\$3,150,000</u>
Subtotal	\$13,500,000	\$2,000,000	\$15,500,000
Net Fiscal Impact	(\$11,400,000)	(\$1,600,000)	(\$13,000,000)

10. Without its tax-exempt status, the City would collect as much as \$2.5 million annually from UC under its 2020 LRDP.

Estimates of property tax, assessment, and ad valorem tax payments were made for the new development program proposed by the 2020 LRDP. Using approximations of assessed valuation based on private sector building comparables and 2020 LRDP estimates of square footage, the lost revenues were calculated. These lost annual revenues were estimated at \$2.5 million annually at 2020 LRDP buildout in 2003 dollars. The payment of these City charges by UC would cover the new public service cost impacts of UC. An approximation was also made of the lost revenues associated with the current UC size. The current loss of revenues was estimated at \$10.8 million.

11. Inflation will increase the annual payments required from UC.

All results are provided in constant 2003 dollar terms. Actual annual payments required from UC through time will be higher due to inflation. Fair share compensation/mitigation payments should be converted from the 2003 dollar estimates into a nominal dollar payment in the relevant year.

KEY METHODS AND ASSUMPTIONS

This analysis is based on a set of calculations and assumptions regarding UC population; UC academic, residential, and associated facilities; and UC demand for City services and infrastructure. All assumptions are described in the text and footnoted in the Report tables. Key methods and assumptions are described below:

- **Scale of UC Impact.** For analysis purposes, this Report considers UC as a major activity center in the City of Berkeley, providing both jobs and housing, and generating significant activity on the campus and in the surrounding area. The Report evaluates the public service demands and impacts of UC-related population (including students, faculty, staff, visitors, and vendors) when they are on or around UC campus/ facilities or commuting to them. As a result, students who live and study on campus will have a greater impact than students who commute to it from other places of residence. This more focused approach creates a more clearly defined analysis and avoids the complications of considering secondary impacts – for example, the evening/ weekend cost and revenue implications of UC staff living in the City of Berkeley.
- **Current and Projected UC Size.** At the base of the impact analysis is the “project description”, which includes estimates of the current UC population and facilities and the expected additions under the 2020 LRDP. The Report relies primarily on information provided by UC to estimate current and projected UC population as well as current and projected UC facilities (e.g., campus beds, academic and support space, and parking spaces). When additional information – such as full-time campus residents and square-feet-per-bed conversion factors – was required, EPS developed estimates based on existing conditions and other data sources.
- **Two Approaches to Estimating Impacts.** The Report takes two approaches to estimating UC impacts. The primary approach estimates the service demands and associated costs of providing public services for each major City department. In cases where UC partially covers its service demands by providing its own set of services (such as police and recreational facilities), the net demand on City services is estimated. The service costs to each department are then summed and revenues generated by UC (such as sales taxes) are subtracted to determine the net fiscal impact of UC. The second approach estimates the revenues not paid by UC given its tax status. Without this special tax status, UC would pay a number of taxes and assessments which would be available to cover their public service cost impacts. These two approaches provide alternative (not additive) estimates of UC’s fiscal impact on the City.
- **Service Demand.** UC service demands are tied to measurable components of UC, such as UC population or UC facilities. For categories of impact that correlate with population size, for example, this Report employs a population-based service demand approach, subtracting out the services provided by UC. This approach recognizes differences in service demands by different categories of UC affiliates (e.g., students living on-campus versus off-campus) as well as differences from typical full-time Berkeley residents. In general, this report assumes that the full set of service demands associated with full-time campus residents can be attributed to UC and will be at the same level of service demands as full-time Berkeley residents. Only half of the service demands of off-campus residents and UC faculty/ staff, however, are attributed to UC as they only spend about half their time in and around UC facilities.

- **Departments Evaluated.** As mentioned above, the primary approach to impact analysis in this Report starts with an evaluation of the service demand and cost impacts by City Department. The evaluation considers the seven departments where the impacts are likely to be greatest, including fire and emergency services, police, public works, transportation, parks and recreation, planning, and health and human services. Other departments will be somewhat affected but are not evaluated, including a range of General Government services, a portion of whose costs are variable as City population grows.
- **Cost Estimates.** The cost calculations described throughout this report were developed using information provided by the City and using departmental budget data reported in the City's Proposed FY 2004 & 2005 Biennial Budget ("FY 2003 Adopted" figures). Costs per unit of service provision were presumed to remain constant (in 2003 dollars) unless otherwise noted. With the exception of wastewater and stormwater services, no adjustment was made for the fact that City levels of service and expenditures might be higher if UC covered a greater share of its public service costs.
- **Capital vs. On-Going Costs.** Public service impacts can be divided into capital impacts and on-going impacts. Whenever possible, this report distinguishes between these costs – capital costs are those associated with one-time purchases of equipment or facilities that depreciate over time. In many cases this distinction is based on capital line items reported in each department's annual budget summary (i.e., "capital outlay"). In other cases, certain "capital" costs were not specifically included in the "capital outlay" line item because capital items were paid for annually (i.e., annual departmental payments to the Vehicle Replacement Fund, which is used to purchase new vehicles). In such cases EPS performed additional research to transfer such items from non-capital to capital budget estimates. The on-going costs include the regular personnel, supplies, and equipment costs associated with providing public services.
- **Lost Revenue Calculations.** Lost revenues calculations were based on the City's average allocation of property taxes for private development, the current schedule of assessments on property, and pertinent rates for other charges on development not paid by UC. The assessed value of UC property was estimated by dividing it into residential and institutional buildings and estimating their likely market values if developed and sold/ leased by a private developer.

REPORT ORGANIZATION

Following this summary chapter, **Chapter II** discusses the current population, the residential, academic & support profiles, and growth projections used in this analysis. **Chapter III** presents fiscal impact cost calculations for the City departments that are expected to be most significantly affected by UC growth, estimates offsetting revenues generated by UC, and determines the net fiscal impact of UC growth. **Chapter IV** describes an alternative fiscal impact estimate based on the sources of revenue the City does not receive given UC's status as a tax exempt entity.

II. LRDP PROJECT DESCRIPTION

UC is in the process of preparing and adopting a Long Range Development Plan (LRDP) that will outline and guide campus development between 2005 and 2020 (hereafter “2020 LRDP”). UC’s existing LRDP, adopted in 1990 and amended in 2002, is scheduled to expire in 2005. State law requires that UC prepare an Environmental Impact Report (EIR) for any new or updated LRDP, pursuant to the California Environmental Quality Act (CEQA). In association with the CEQA process, UC published a Notice of Preparation (NOP) of its proposed LRDP on August 29, 2003 that: (1) describes the purpose of the proposed LRDP, (2) outlines current development and development proposed to occur under the LRDP, and (3) summarizes the findings of the CEQA initial study, which defines what environmental impacts will be addressed in the EIR.

All assumptions used in this report regarding current and projected UC development were taken directly from the August 29 NOP. Assumptions regarding population and development in the City of Berkeley were compiled from a variety of sources as cited in the text and tables. **Table 4** presents a summary of current, proposed, and total projected development, with more detailed demographic and development assumptions presented for UC and the City in **Tables 5** and **6**.

EXISTING CONDITIONS AND SERVICE POPULATION

As summarized in **Table 4**, UC is currently estimated to consist of 31,800 daytime students and 14,135 faculty and staff. In terms of physical development, UC currently operates 8,200 “campus beds” and occupies 12.1 million square feet (sqft) of “academic and support” space. The estimate of campus beds provided in the NOP does not include several categories of “unofficial” UC beds—such as fraternities, sororities, and cooperative housing. At the City’s request, UC estimated that these affiliated residential categories comprise approximately 3,400 additional beds, for a total of 11,600 beds, as summarized in **Table 5**. Assuming residential density is 223 sqft per bed, total current residential square footage is estimated at about 2.6 million sqft.¹ With current academic and support space, UC’s current total square footage is estimated at 14.7 million. Finally, UC currently owns and operates 7,600 parking spaces.

¹ The estimated residential density factor of 223 sqft per bed was calculated by dividing total residential sqft (approximately 1.8 million, as reported on UC’s website), by the current number of “official” campus beds (8,200), as the 1.8 million figure is assumed not to include fraternities, sororities, and cooperative housing.

Table 4
Project Description -- UC Summary
UC Berkeley Fiscal Impact Analysis

Item	Current	Net New	Total
Population			
Student	31,800	1,650	33,450
Faculty/Staff (1)	<u>14,135</u>	<u>3,670</u>	<u>17,805</u>
Total	45,935	5,320	51,255
Residential			
Beds	11,600	2,600	14,200
Square Feet (2)	2,581,874	578,696	3,160,570
Academic & Support (SqFt) (3)	12,100,000	2,200,000	14,300,000
Total SqFt	14,681,874	2,778,696	17,460,570
Parking Spaces	7,600	2,300	9,900
Total City population	106,350	--	--
Student residents of City (4)	<u>19,398</u>	--	--
Non-UC residents	86,952	--	--

(1) This category includes faculty, academic and non-academic staff, and "other visitors/vendors" as reported in the LRDP.

(2) Assumes 223 SqFt per bed, based on current beds per total residential SqFt.

(3) The 2.2 million new square feet includes 1.0 million on-campus and 1.2 million off-campus.

(4) According to UC staff, 39 percent of UC students report addresses outside the City of Berkeley.

Source: UC Berkeley LRDP/NOP; Economic & Planning Systems, Inc.

Table 5
Project Description -- UC Residential
UC Berkeley Fiscal Impact Analysis

Item	Current	Net New	Total (2020)
Beds			
Campus beds (1)	8,200	2,600	10,800
<u>Other UC beds (2)</u>	<u>3,400</u>	<u>0</u>	<u>3,400</u>
Subtotal	11,600	2,600	14,200
Population			
Total Students	31,800	1,650	33,450
On-campus (3)	11,600	2,600	14,200
Off-campus (4)	20,200	-950	19,250
Faculty/Staff (5)	<u>14,135</u>	<u>3,670</u>	<u>17,805</u>
Total Population	45,935	5,320	51,255
Student Population by Place of Residence			
Outside Berkeley (6)	12,402	--	--
City of Berkeley	19,398	--	--

All data from NOP for LRDP, unless otherwise noted.

(1) Beds formally operated by UC. Most are close to, but not on, core campus.

(2) Includes fraternities, sororities, and UC-recognized off-campus housing (cooperative housing, international house, etc.) (Provided by UC, February 10, 2004). Does not include students/faculty living in privately-owned housing.

(3) Equal to the number of campus beds.

(4) Total students minus campus beds.

(5) This category includes faculty, academic and non-academic staff, and "other visitors/vendors" as reported in the LRDP.

(6) According to UC staff, 39 percent of UC students report addresses outside the City of Berkeley.

Source: UC Berkeley LRDP/NOP; Economic & Planning Systems, Inc.

Table 6
UC Service Population Equivalent (1)
UC Berkeley Fiscal Impact Analysis

Item	Total Peak Population (existing)	Service Pop. Factor (2)	Estimated Peak Service Population			Percent Increase
			Current	Net New	Total	
<u>UC Service Population</u>						
On-campus student residents	11,600	1.00	11,600	2,600	14,200	22%
Off-campus students	20,200	0.50	10,100	(475)	9,625	-5%
<u>Faculty/Staff</u>	<u>14,135</u>	0.50	<u>7,068</u>	<u>1,835</u>	<u>8,903</u>	<u>26%</u>
Total	45,935		28,768	3,960	32,728	14%
<u>City-wide Service Population</u>						
City residents not employed	51,676	1.00	51,676	--	--	--
City residents working in Berkeley (3)	23,588	1.00	23,588	--	--	--
City residents working outside Berkeley (3)	31,086	0.50	15,543	--	--	--
<u>Non-Residents working in Berkeley (4)</u>	<u>53,612</u>	0.50	<u>26,806</u>	--	--	--
Total Peak City-wide Service Population	159,962		117,613	--	--	--
UC Service Population as % City-wide			24%			

(1) Service population is a measure used to estimate the relative impact of different demographic groups at the height of on-campus activity (i.e., during term-time).

(2) The service population factor measures the relative contribution of different demographic groups to peak service demand. Off-campus students, faculty, and staff are assumed to spend about half (50 percent) of their day on or round campus/ UC facilities. As a result, their service demand attributable to UC is set at 50 percent. City residents who work outside of the City and non-residents working in the City are assumed to spend about half (50 percent) of their day in the City. As a result, their service demand attributable to UC is set at 50 percent.

(3) U.S. Census Bureau, 2000 "journey to work" data.

(4) ABAG 2002

Source: Census 2000; ABAG; UC Berkeley LRDP/NOP; Economic & Planning Systems, Inc.

The total current population of the City of Berkeley is estimated at 106,350.² This estimate includes UC students who are residents of Berkeley and other residents. As shown in **Table 4**, based on estimates of student resident status provided by UC, this analysis estimates that approximately 19,400 students are Berkeley residents, and the remaining population consists of roughly 87,000 residents.

This analysis uses current population counts by demographic category (e.g., UC students living on campus, UC students living off-campus, faculty/staff, etc.) to estimate a current “service population.” These estimates equate the total UC population to Berkeley resident equivalents, based on the amount of time each population segment is expected to spend on and around campus, and thus result in a demand for City services that may be attributed to UC based on the methodology underlying this analysis. This analysis assumes that campus residents represent the same demand for services as a typical full-time Berkeley resident (a resident who lives and works in the City), while off-campus residents, faculty, and staff each represent one-half the demand of a typical Berkeley resident – i.e. because about half their time is spent at and around the campus, off-campus population’s average service demand will be half that of a full-time Berkeley resident. Similarly, Berkeley residents who work outside of the City are given half the weight of a full-time Berkeley resident as are nonresidents who work in Berkeley but live elsewhere.

As shown in **Table 6**, this results in an estimated total current UC service population of about 28,800 and a total current City service population of 117,600. As a result, UC service population represents 24 percent of the City service population. The new LRDP is also shown to increase the UC service population by 3,960, or 14 percent. These estimates are used to calculate the service demand and cost impacts of the UC where no better measures were available. The approach used for each department is described in subsequent chapters.

DEVELOPMENT ESTIMATES AND ASSUMPTIONS

This analysis calculates fiscal impacts associated with “net new” development under the proposed LRDP. “Net new” development represents the net increase in each development type, taking into account proposed construction as well as proposed renovation, conversion, and demolition of existing facilities. All development estimates presented in the NOP are assumed to represent net new development. As summarized in **Table 4**, the proposed LRDP addresses construction of 2,600 net new “campus beds,” 2.2 million net new sqft of “academic and support space” and 2,300 net new parking spaces. These proposed amounts represent net increases over existing development of 22 percent, 18 percent, and 30 percent, respectively. The proposed LRDP also describes

² This number was developed and provided by the City of Berkeley, and reflects the City’s proposed adjustment to the 2000 Census, which the City believes missed approximately 6,000 UC students/Berkeley residents. This proposed adjustment has been reviewed and endorsed by UC, but has yet to be officially adopted by the U.S. Census Bureau.

the expansion of campus population to include an additional 1,650 students and 3,670 faculty/staff, increases of 5 percent and 26 percent, respectively. Using the same methodology described above, and as summarized in **Table 6**, this analysis estimates that population growth associated with the proposed LRDP will result in a net new UC service population equivalent of 3,960, an increase of 14 percent.

Figures presented in the proposed LRDP represent development “caps”: future development in excess of these amounts would require UC to prepare individualized EIRs, and the conclusions of the proposed LRDP’s EIR (under development) would not apply to this additional growth. While the proposed LRDP presents total development “caps,” it provides very little information regarding the location, configuration, or density of projected development. In particular, the proposed LRDP states that all residential development will occur within a “housing zone,” though this zone is defined so broadly that no conclusions can be made regarding specific locations.³

The ultimate fiscal impact experienced by the City will depend on the specific location of future development. For example, municipal infrastructure in certain parts of the City has greater capacity than in other areas, and development would thus be more easily accommodated in certain areas than in others. Similarly, whether future development occurs on property already owned by UC or on property that is currently under private ownership will significantly influence future changes in property tax revenues received by the City. Because very little information was provided regarding location of development, this report developed a “location blind” methodology. A greater degree of specificity, such as that provided in the 1990 LRDP, would have allowed a more location-specific, and potentially more accurate, fiscal impact methodology.

³ The “housing zone” is defined as any part of Berkeley or Oakland that is “within a mile of the center of campus, or within a block of a transit line providing trips to campus in under 20 minutes.”

III. COST APPROACH— FISCAL IMPACT ESTIMATES BY DEPARTMENT

This chapter is divided into eight sections, each presenting the methodology and fiscal impact calculation for the City services provided by that department. The Public Works Department is split into two sections, one for sewer and stormwater services and one for transportation-related services, some of which are provided by the Transportation department. The following seven departments are expected to experience the most significant fiscal impact in association with UC's 2020 LRDP:

- **Fire and Emergency Medical Services**
- **Police**
- **Public Works (Sewer / Stormwater)**
- **Public Works / Transportation**
- **Parks & Recreation**
- **Planning**
- **Health and Human Services**

Each section below describes the range of services provided by the City and UC; any existing or historical mitigation arrangements between the City and UC designed to offset UC impacts; and the assumptions, methodology, and calculations used to estimate the fiscal impacts associated with UC. The estimates for Public Works (Sewer/Stormwater) are taken from Brown and Caldwell, April 2004, Final Report *City of Berkeley Sewer Service Charges and Connection Fees, and Clean Stormwater Study and the Evaluations of "Fair Share" Contributions from the UC Regents* (B&C Report).

FIRE AND EMERGENCY MEDICAL SERVICES

This section describes the methodology used to calculate UC-related fiscal impacts for fire and emergency medical facilities and services. As UC expands in size and population, additional capital facilities and equipment will be required to maintain existing fire and emergency medical service standards.

SERVICE DESCRIPTION

UC has its own fire inspection and code enforcement personnel, but does not maintain a firefighting or EMS staff. As a result, the Berkeley Fire Department (BFD) provides the vast majority of fire and emergency medical protection to UC. The BFD service to UC includes standard responses to calls for service. In addition, the BFD staff reported that UC campus creates a complex and intensive source of demand for fire and emergency medical services and equipment.

The BFD determines its service and response standards by weighing a variety of factors including City-wide unit coverage, response times, building size, nearby population, health and safety issues (e.g., hazardous materials), property value, and insurance risk, among other factors. Covering more than 1,200 acres, UC campus houses a variety of facilities that create the need for specialized fire response, including wildfire response units for steep hillside preserves, ladder trucks for high-rise residential dormitories, HAZMAT units for laboratories and facilities containing hazardous materials, and elevated response times based on high property values (e.g., rare books, laboratory equipment, etc.).

HISTORICAL MITIGATION

Since 1990, UC has contributed to fire department operations in the form of fixed annual payments of \$50,000 for fire/HAZMAT training and four one-time payments totaling \$914,000 for equipment purchases. The annual payments are scheduled to expire at the end of the 2005-2006 academic year, and no formal agreement was reached or is currently in place to provide continued funding for the purchase of equipment.⁴

⁴ Although the 1990 Mitigation Implementation Agreement between the City and the UC Regents called for the City Manager and Vice Chancellor to develop a set of service standards and a schedule of equipment acquisition and replacement by the end of fiscal year 1990-1991, these measures were never developed. The Fire Department and UC Environmental Health and Safety Department continue to work towards completing these elements of the Agreement.

FISCAL IMPACT CALCULATION

As described above, the BFD uses a complex set of inputs to determine fire staffing, response, and service standards. Unfortunately, there is no fire department-specific data that accurately measures the UC's impact on the need for staff, supplies, equipment, and facilities. Based on interviews with BFD staff and a review of available data, EPS determined the best way to estimate BFD expenditures in serving UC would be to use the relative service population numbers for UC and the City as a whole.

Table 6 in **Chapter II** shows the service population calculations and estimates that the UC-related service population is about 24 percent of the total City service population. Applying this methodology to the fire department implicitly assumes that the demand for services from persons who spend their daytime in the City (e.g., employees who live elsewhere) is half that of persons who spend their full day in the City (e.g. residents who are employed in the City). This is a standard assumption that has been used to estimate public safety service demand in a number of cities.

The total BFD budget allocation is \$23,551,000. BFD budget data was categorized and divided between capital costs and on-going costs based on input from BFD staff; on-going service costs represented about 71 percent of total costs, while capital expenditures constituted the remaining 29 percent, including the purchase or lease of facilities, major equipment, and machinery. As a result, the total annual fire department cost per service population is \$200, including \$58 on capital costs and \$142 on noncapital costs.

Estimates of existing and new UC-related fire service cost impacts were based on these factors. The existing cost per service population was applied to the UC's existing service population and its new service population under the LRDP to derive UC's impacts on costs. **Table 7** below summarizes the results of this analysis and **Table 8** provides the full set of assumptions and calculations.

Table 7
Annual Fire Service Impacts (2003\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
On-Going Costs	\$4,087,000	\$563,000	\$4,649,000
Capital Costs	\$1,673,000	\$230,000	\$1,903,000
Total	\$5,760,000	\$793,000	\$6,553,000

Table 8
UC-Related Fire Department Impacts
UC Berkeley Fiscal Impact Analysis

Item	Amount	Methodology	
		Formula	Source
<u>Service Population (1)</u>			
UC Existing	28,768	a1	See Table 6
UC New LRDP	3,960	a2	See Table 6
City Existing	117,613	b	See Table 6
UC as proportion of City (existing)	24%	c = a1 / b	calculation
<u>BFD Operational Costs</u>			
Total Fire Budget (2003 Adopted)	\$23,551,100	g	City Budget
Capital Outlay (2)	\$6,840,544	h	City Budget (1)
Non-capital expenditures	\$16,710,556	i = g - h	calculation
Total cost per service population	\$200	j = g / b	calculation
Average capital cost per service pop.	58	k = h / b	calculation
Average non-capital cost per service pop.	\$142	l = i / b	calculation
<u>Annual UC-related Fire Service Cost Calculations</u>			
Current capital costs	\$1,673,160	m = a1 * k	calculation
<u>Current non-capital costs</u>	<u>\$4,087,311</u>	n = a1 * l	calculation
Current, total costs	\$5,760,471	o = m + n	calculation
Net new capital costs	\$230,319	p = a2 * k	calculation
<u>Net new non-capital costs</u>	<u>\$562,640</u>	q = a2 * l	calculation
Net new, total costs	\$792,960	r = p + q	calculation
Total (2020) capital costs	\$1,903,479	s = m + p	calculation
<u>Total (2020) non-capital costs</u>	<u>\$4,649,951</u>	t = n + q	calculation
Total (2020), total costs	\$6,553,431	u = s + t	calculation

(1) City Budget - Adjusted FY 2004 data.

(2) Includes facilities, vehicles, and major equipment.

BFD = Berkeley Fire Department

Sources: Berkeley Fire Department; City of Berkeley; Economic & Planning Systems, Inc.

POLICE

This section describes the methodology used to calculate UC-related fiscal impacts for police services. As UC expands in size and population, additional capital facilities and equipment will be required to maintain existing police service standards.

SERVICE DESCRIPTION

Under the current Departmental Order (March 1, 1999), UC police have operational responsibility of UC campus and certain off-campus buildings, and the Berkeley Police have operational responsibility for the entire City of Berkeley outside UC campus, including all UC-property outside campus boundaries not specifically assigned to UC police. UC police have legal authority to exercise police powers on campus and within one mile of campus, while City police have legal authority throughout the entire City, including UC campus.

In practice, joint police operations are conducted in a cooperative manner, with officers responding to calls for service in both territories when requested and/or appropriate. City police play a more significant role in serving the UC population than vice versa. For example, City police address incidents around campus and other UC facilities involving students, faculty, and staff (whether as victims or perpetrators) and provide specialized services such as large-scale crowd control, traffic control, and booking facilities.

HISTORICAL MITIGATION

Costs incurred by the City to respond to some UC requests—crowd control at football games and use of the City’s booking facility, for example—are partially reimbursed by UC on a case-by-case basis. Other costs, however, such as responding to student-related incidents in the vicinity of campus and instituting a weekend over-time patrol (“party patrol”) near the fraternities/sororities in the southside area, are not reimbursed, and represent City police costs directly attributable to UC.

FISCAL IMPACT CALCULATION

Based on interviews with BPD staff, EPS determined that the best way to estimate BPD expenditures to serve UC would be to consider annual CFS generated in the vicinity of campus. The Federal Clery Act requires all campuses and universities participating in Federal student aid programs to report annual crime statistics on campus and in the areas immediately surrounding campus. In complying with the Clery Act, UC selected an expanded campus boundary (the “Clery area”) and requests annual crime statistics

from the BPD within this area to produce its annual UC Clery Report⁵ (see **Figure 1**). It should be emphasized that this crime reporting boundary was specifically defined by UC to capture crimes occurring in the vicinity of campus.

The BPD provided data for CFS occurring in the Clery area between 2000 and 2002. The majority of UC official and unofficial (e.g., fraternities, sororities, and co-ops) residences are located within this area, and UC population living off-campus also spend much of their time in the Clery area. Overall, approximately 14 percent of annual City CFS occur in the Clery area.

As BPD staff have pointed out, while UC population both generates CFS directly and indirectly (i.e., by contributing to a “target rich” environment that attracts criminal activity from other areas), not all CFS within the Clery area can be attributed to UC or its affiliates. Many persons unrelated to UC live and work in the area. Unfortunately, neither the City, the BPD, nor the UC police collects crime reporting or statistical data that allow an accurate estimate of those Clery area calls specifically affiliated with UC. The current UC-related population counts provided above and 2000 Census Data on jobs and households in the Clery area can, however, be used to provide an indication of the proportion of the calls that are UC-related as described below.

TAZ-level land use analysis conducted by the Hausrath Economics Group (HEG) and adjusted based on the boundaries of the Clery area imply that 18,500 people live in the Clery area (including the core campus) and 21,100 jobs are located in the Clery area (see **Table 9**). About 11,600 of these residents are on-campus students and 14,135 of these jobs are UC-related jobs. As a result, the residents not directly associated with UC in the Clery area total 6,900 and the jobs not directly associated with UC total 7,000. Commute pattern information was not available for non-UC-related commutes into and out of the Clery area, so all residents were counted as full time residents, and the non-UC service population in the Clery area was conservatively estimated at 10,400 (the sum of 6,900 and 3,500).

The relative presence of UC and other service populations in the Clery area combined with the number of calls for service (to both UC police and the BPD) were then used to estimate the proportion of calls addressed by the BPD that were generated by UC-related service population. As shown in **Table 10**, the total service population in the Clery area is 39,200 including 28,800 UC-related and 10,400 other. According to UC, the UC police responded to 23,000 calls for service in 2002 while the BPD responded to 26,000 calls for service in the Clery area, for a total of 49,000 CFS emanating from the Clery area. This represents an average of 1.25 CFS per service population. Assuming that the UC service population and the non-UC service population are similar in their

⁵ The Clery Act states that annual crime statistics must be reported for the campus, unobstructed public areas immediately adjacent to or running through the campus, and certain non-campus facilities including Greek housing and remote classrooms. The UC Clery area is bordered by Derby Street (east of College Avenue) and Dwight Way (west of College Avenue) to the south, Shattuck Avenue to the west, and Virginia Street to the north.

Figure 1

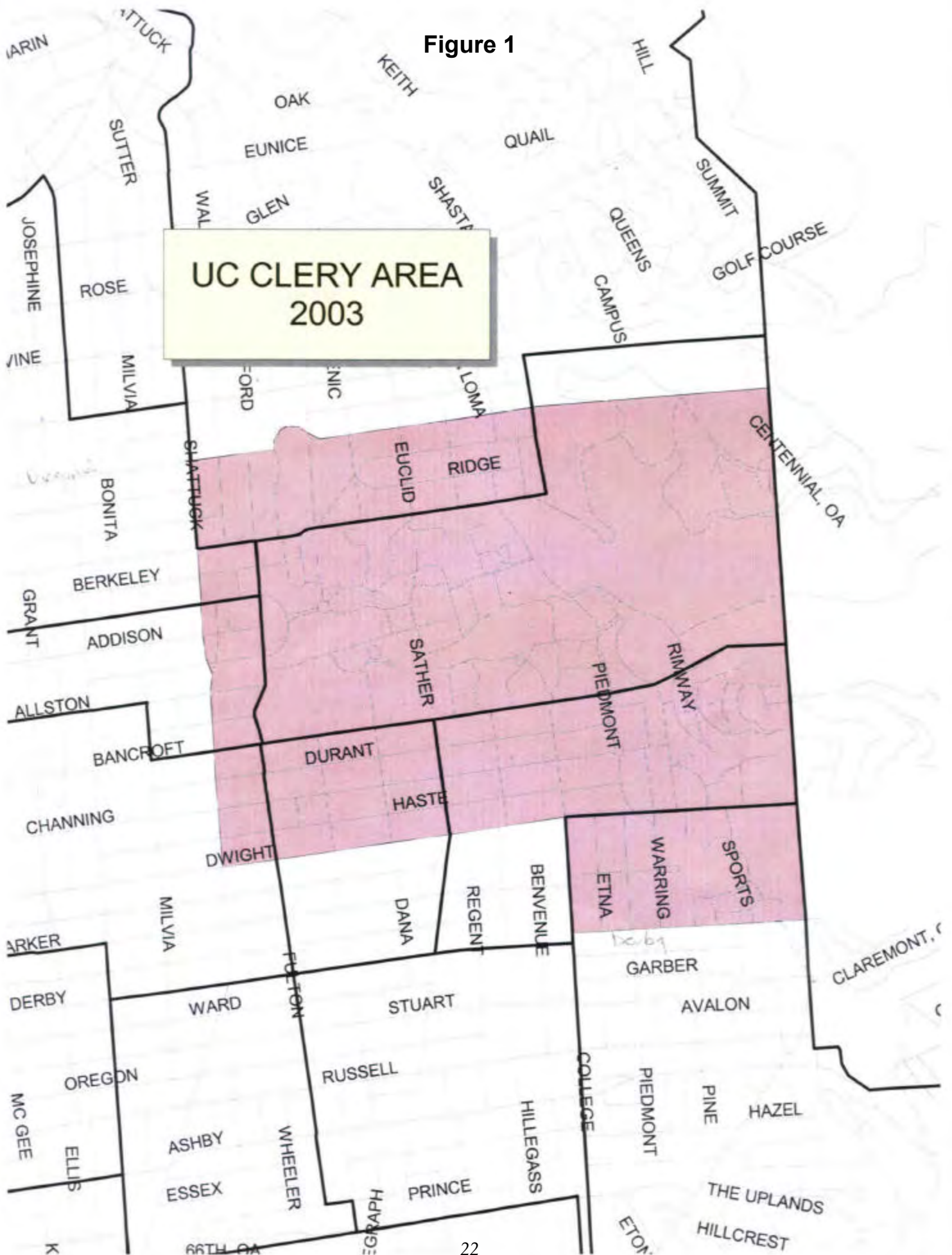


Table 9
Population and Jobs in Clery Area, 2000
UC Berkeley Fiscal Impact Analysis

Item	Complete TAZ (2)		Overlap % (3)	TAZ in Clery Area	
	Population	Jobs		Population	Jobs
<u>TAZs (1)</u>					
21	4,120	1,080	60%	2,472	648
20	3,556	4,043	30%	1,067	1,213
402	183	930	100%	183	930
403	84	790	100%	84	790
404	588	787	100%	588	787
22	1,203	11,165 (4)	100%	1,203	11,165
24	4,311	450	100%	4,311	450
401	2,137	328	100%	2,137	328
805	2,242	1,532	100%	2,242	1,532
806	327	1,402	100%	327	1,402
25	987	863	100%	987	863
808	958	442	100%	958	442
35	<u>3,924</u>	<u>1,117</u>	50%	<u>1,962</u>	<u>559</u>
Total	24,620	24,929		18,521	21,108
UC-related (5)	--	--		11,600	14,135
Non-UC	--	--		6,921	6,973
Non-UC Service Population (5)				6,921	3,487

(1) TAZs that overlap with Clery area.

(2) Data from Hausrath Economics Group (HEG) UCB/LBNL Land Use Database January 28, 2004 memo.

(3) EPS estimate based on comparison of maps and land area overlap.

(4) Excludes UC LBNL employment.

(5) See Table 5.

(6) Conservatively high as assumes all non-UC related Clery area residents spend their days in the Clery area. Jobs are given a 50 percent service factor

Source: HEG; EPS

Table 10
BPD CFS generated by UC and Non-UC
UC Berkeley Fiscal Impact Analysis

Item	UC	City	Total
Service Population	28,768	10,408	39,175
CFS Responses (BPD & UCP) (1)	23,000	26,055	49,055
CFS/ serv. Capita	1.25	1.25	1.25
CFS Generated	36,023	13,032	49,055
CFS BPD Responses	13,023	13,032	26,055
Proportionate Share	50%	50%	100%

(1) Includes UC-provided 23,000 CFS addressed by UC police and BPD-provided 26,055 calls addressed by BPD in Clery area.

Source: UC; BPD; EPS

police service requirements, UC is estimated to generate about 36,000 CFS and the City 13,000. Given that UC police respond to 23,000 CFS, the net overflow of UC CFS into the Clery area is about 13,000, similar to the number of CFS generated by non-UC related population. In other words, 50 percent of the CFS addressed by BPD in the Clery area are UC-related, while 50 percent are non-UC-related. This represents about 7 percent of all BPD CFS.

The total BPD annual budget allocation is \$39.6 million, 97 percent of which is for on-going costs and 3 percent for capital costs, including the purchase/ leasing of facilities, vehicles, machinery, and major equipment. The existing UC cost impact was estimated based on these costs expressed on a per-CFS basis and the estimated number of BPD CFS generated by UC. The costs associated with the 2020 LRDP were then estimated based on the increase in the service population. **Table 11** shows the results of this analysis and **Table 12** provides a full set of assumptions and calculations.

In addition to police service demand generated by CFS, civil unrest that is catalyzed on the campus and driven by students occurs periodically in the City and creates demand for police services. This additional demand includes large incidents, such as the Volleyball Court riots and the Rosebud Denovo shooting riots in the 1990s, as well as smaller incidents that require BPD policing, such as "standard" political protest marches. The BPD estimates that the smaller events result in an annual cost of about \$60,000 in police time, including about \$30,000 in overtime and \$30,000 worth of time of on-duty staff. A turbulent year with larger events can result in an additional annual cost of \$450,000, including about \$150,000 in overtime and \$300,000 worth of on-duty staff. These types of larger events and/or years only happen periodically, however. Assuming such events occur once every five years, the average annual cost due to these larger events is \$90,000, for a total annual average cost of \$150,000, including small and large events. For the purposes of this analysis, it is assumed that the number and cost of events will increase proportionally with the increase in the number of students. Given that the number of students is expected to increase by 5.2 percent under the new LRDP, the additional annual cost associated with the new development is estimated at about \$8,000 each year. **Table 11** also shows these cost impacts.

Table 11
Annual Police Service Impacts (2003\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
On-Going Costs (general CFS)	\$2,759,000	\$380,000	\$3,139,000
On-Going Costs (civil unrest)	\$150,000	\$8,000	\$158,000
Capital Costs	\$74,000	\$10,000	\$84,000
Total	\$2,984,000	\$398,000	\$3,382,000

Table 12
UC-Related Police Department Impacts
UC Berkeley Fiscal Impact Analysis

Item	Amount	Methodology	
		Formula	Source
<u>BPD Calls-for-service Data (2000-'02)</u>			
City-wide CFS	181,930	a	BPD (1)
CLERY Area CFS	26,055	b	BPD (2)
CLERY CFS as % City Total	14.3%	$c = b / a$	calculation
Assumed CLERY calls associated w/ UC	50.0%	d	See Table 10
Percent City-wide CFS associated w/ UC	7.2%	$e = c * d$	calculation
BPD CFS associated with UC	13,028	$f = b * d$	calculation
<u>Service Population</u>			
UC Existing	28,768	g	See Table 6
UC New LRDP	3,960	h	See Table 6
UC Percent Growth	14%	$i = g + h$	See Table 6
<u>BPD Operational Costs</u>			
Total BPD Budget (2003)	\$39,579,019	j	City Budget
Capital Outlay (4)	\$1,039,377	k	City Budget (3)
Non-capital expenditures	\$38,539,642	$l = j - k$	calculation
Total cost per CFS	\$217.55	$m = j / a$	calculation
Average capital cost per CFS	\$5.71	$n = k / a$	calculation
Average non-capital cost per CFS	\$211.84	$o = l / a$	calculation
<u>Annual UC-related Police Service Cost Calculations</u>			
Current capital costs	\$74,427	$p = n * f$	calculation
Current non-capital costs	\$2,759,716	$q = o * f$	calculation
Current, total costs	\$2,834,143	$r = p + q$	calculation
Net new capital costs	\$10,245	$s = p * i$	calculation
Net new non-capital costs	\$379,890	$t = q * i$	calculation
Net new, total costs	\$390,135	$u = s + t$	calculation
Total (2020) capital costs	\$84,672	$v = p + s$	calculation
Total (2020) non-capital costs	\$3,139,606	$w = q + t$	calculation
Total (2020), total costs	\$3,224,278	$x = v + w$	calculation

(1) Based on a BPD query of RMS Data from 2000, 2001, and 2002.

(2) The CLERY Area is a region defined by UC Berkeley for the purposes of mandatory reporting of annual crime statistics in the vicinity of UC campuses. From its northern edge on Virginia Street, it is bounded by Shattuck Street, Dwight Way, College Street, and Derby Street. The eastern boundary is in the Berkeley Hills.

(3) City Budget - Adjusted FY 2004 data.

(4) Includes facilities, vehicles, and major equipment.

CFS = Calls for service; BPD = Berkeley Police Department

Sources: Berkeley Police Department; UC Berkeley; City of Berkeley; Economic & Planning Systems, Inc.

WASTEWATER, STORMWATER, SOLID WASTE

This section estimates UC-related fiscal impacts for facilities and services funded by the City of Berkeley Public Works Department for wastewater, stormwater, and solid waste. The cost estimates are based on the Brown and Caldwell, April 2004, Draft Report, *City of Berkeley Sewer Service Charges and Connection Fees, and Clean Stormwater Fees Study for the Evaluation of "Fair Share" Contributions from the UC Regents* (B&C Report).⁶ The cost estimates presented in this chapter are for both existing UC impacts and additional future impacts under the 2020 LRDP and are shown in 2003 dollar terms. The estimates are equivalent to the nominal dollar estimates shown in Chapter 5: Mitigation Implementation Agreement 'Fair Share' Information of the BC Report, Table 5.2.

SERVICE DESCRIPTION

UC constructs and maintains the wastewater and stormwater infrastructure on campus, while the City operates, maintains, constructs, and replaces the infrastructure that collects wastewater and stormwater from the terminal distribution points at the borders of the UC campus and delivers it to the EBMUD interception main (wastewater) or tidal gates to the San Francisco Bay (stormwater). UC currently provides its own solid waste and recycling services for the campus, and contracts independently with a solid waste receiving yard in Richmond for disposal. The City also provides all these services (wastewater, stormwater, solid waste) for UC-owned off-campus facilities.

MITIGATION

The City does not receive sanitary or storm sewer service charge revenues from UC as it does from other public and private sewer users in Berkeley. In addition to EBMUD wastewater treatment charges, EBMUD collects City sewer fees on its Berkeley consumer bills on behalf of the City. EBMUD collects the sewer fee from all EBMUD water customers except UC.⁷ For stormwater, the City recoups expenses as a stormwater fee on annual tax bills; as a tax-exempt agency, UC does not pay this fee.

UC has historically reimbursed a portion of its sanitary/storm sewer cost through per-unit sewer hook-up fees (\$200 per new residential unit), annual lump sum payments of \$250,000 in sewer capital facility fees, and escalating annual lump sum payments of sewer O&M fees (approximately \$207,000 in 2002). In addition, UC has paid varying fees for other utilities, including stormwater (approximately \$32,800 in 2002). The agreement establishing these payments will expire at the end of the 2005-'06 academic year.

⁶ Solid waste costs were estimated by City staff.

⁷ EBMUD could charge UC for City sewer service using the EBMUD billing system.

FISCAL IMPACT CALCULATION

The B&C Report estimates all of the costs of providing wastewater and stormwater service to UC, except for the capital costs associated with the stormwater infrastructure and the additional stormwater costs associated with the 2020 LRDP. It estimates the UC cost impact in fiscal year 2005/06 in addition to the annual incremental impacts associated with UC growth under the 2020 LRDP (assuming a consistent growth rate though 2020/21) and an expected rate of cost escalation.⁸ EPS converted the B&C Report results into 2003 dollar terms and evaluated the solid waste services. The results of these analyses are provided below.

SOLID WASTE

At the current time, UC primarily contracts solid waste collection and disposal independently with an operator outside Berkeley. UC's waste disposal is nonetheless counted against the City of Berkeley's diversion requirements, which define waste disposal goals and City charges. UC maintains an account with the Berkeley transfer station, and is reportedly considering diverting its plant debris to the Berkeley facility where it can be composted. Because the remaining capacity of the Berkeley transfer station is relatively limited, if this additional disposal by UC were to occur, the City might need to expand capacity, which would result in a fiscal impact partially attributable to UC. At the current time, City staff estimate the annual cost impact associated with solid waste totals \$68,500. This includes \$14,500 for roll-off bins and disposal for end and beginning semester cleanups and \$54,000 in special neighborhood pickups for the UC campus area.⁹

SANITARY SEWER/ CLEAN STORMWATER

Table 13 summarizes the UC cost impacts associated with sanitary sewer and clean stormwater in 2003 dollar terms and **Table 14** shows the detailed time series cost estimates from the B&C Report. The sewer service charges include operating and maintenance costs and replacement costs. The sewer hook-up costs consist of capital costs. As shown, when converted into 2003 dollar terms, the 2005/06 UC annual cost estimate is \$2.63 million, including \$2.51 million in sanitary sewer costs and about \$117,000 in stormwater costs. The new 2020 LRDP is expected to add about \$424,000

⁸ The B&C sewer rate model projects increases in sewer use assuming a fixed annual increase in sewer accounts per year. EPS divided current UC beds and non-residential sqft by current residential and non-residential sewer accounts to develop "sewer account factors" that allowed calculation of annual growth rates associated with proposed LRDP growth. This growth rate was then used in the B&C model to calculate sewer rates and costs relative to current and projected growth as described in the LRDP.

⁹ Roll-off bins and disposal costs estimated based on 30 twenty cubic yard bins at a cost of \$485 per bin. Special neighborhood pick-up costs estimated at three 150-ton pick-ups at \$119.86 per ton. All data provided by City Public Works department.

annually to these costs by LRDP buildout, with incremental costs growing throughout the LRDP period (2005 to 2020). The impact of UC not paying these costs will fall on the system users who will pay higher charges as a result.¹⁰ These results are summarized in **Table 13**.

Table 13
Annual Sewer/ Stormwater Fiscal Impacts (2003\$\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
Sewer Service Charges	\$1,996,000	\$309,000	\$2,304,000
Sewer Hook Up Fees	\$516,000	\$115,000	\$631,000
Clean Storm water Fees (1)	\$117,000	\$0	\$116,000
Solid Waste Cost	\$68,500	\$0	\$68,500
Total	\$2,698,000	\$424,000	\$3,122,000

(1) The B&C Report did not estimate UC stormwater capital cost impacts or clean stormwater fees required to cover growth under the new LRDP.

¹⁰ Generally, sewer and stormwater service charges are calculated by dividing total system costs by the number of accounts to develop rate charges per account. When fewer accounts are available (because EBMUD does not charge UC, for example), the total cost is distributed among the remaining rate payers, thus raising their rates. In this sense, other rate payers are subsidizing UC's "fair share" of system wide costs.

Table 14
Brown and Caldwell Estimates of UC System Sanitary Sewer and Clean Stormwater Costs Projections
UC Berkeley Fiscal Impact Analysis

Cost Category	Fiscal Year Starting									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Nominal Dollar Estimates (1)										
<u>Sewer</u>										
Sewer Service Charges	\$2,117,812	\$2,202,838	\$2,291,208	\$2,383,050	\$2,478,501	\$2,577,702	\$2,680,760	\$2,787,864	\$2,899,173	\$3,014,808
Hook-Up Fees	<u>\$547,672</u>	<u>\$571,721</u>	<u>\$596,841</u>	<u>\$623,066</u>	<u>\$650,427</u>	<u>\$678,957</u>	<u>\$708,873</u>	<u>\$740,033</u>	<u>\$772,472</u>	<u>\$806,417</u>
Total Sewer	\$2,665,483	\$2,774,559	\$2,888,049	\$3,006,116	\$3,128,928	\$3,256,659	\$3,389,633	\$3,527,897	\$3,671,645	\$3,821,225
<u>Stormwater (2)</u>										
Storm Water Fee	\$123,960	\$127,679	\$131,509	\$135,454	\$139,518	\$143,704	\$148,015	\$152,455	\$157,029	\$161,740
Total Sewer/ StormWater	\$2,789,443	\$2,902,238	\$3,019,558	\$3,141,570	\$3,268,446	\$3,400,363	\$3,537,648	\$3,680,352	\$3,828,674	\$3,982,964
2003 Dollar Estimates (3)										
<u>Sewer</u>										
Sewer Service Charges	\$1,996,241	\$2,015,909	\$2,035,708	\$2,055,640	\$2,075,706	\$2,095,908	\$2,116,217	\$2,136,666	\$2,157,257	\$2,177,961
Hook-Up Fees	<u>\$516,233</u>	<u>\$523,205</u>	<u>\$530,286</u>	<u>\$537,462</u>	<u>\$544,722</u>	<u>\$552,054</u>	<u>\$559,591</u>	<u>\$567,174</u>	<u>\$574,792</u>	<u>\$582,573</u>
Total Sewer	\$2,512,474	\$2,539,115	\$2,565,994	\$2,593,102	\$2,620,428	\$2,647,962	\$2,675,808	\$2,703,840	\$2,732,049	\$2,760,534
<u>Stormwater (2)</u>										
Storm Water Fee (4)	\$116,844	\$116,844	\$116,844	\$116,844	\$116,844	\$116,844	\$116,844	\$116,844	\$116,844	\$116,844
Total Sewer/ StormWater	\$2,629,318	\$2,655,959	\$2,682,838	\$2,709,946	\$2,737,272	\$2,764,806	\$2,792,652	\$2,820,684	\$2,848,893	\$2,877,378

(1) From Brown and Caldwell, Draft Report, Sewer Service Charges and Connection Fees, and the Clean Stormwater Fees Study for the Evaluation of "Fair Share" contributions from the UC Regents.

(2) The B&C Report did not estimate UC stormwater capital cost impacts.

(3) The Brown and Caldwell calculations assume a 3 percent annual cost escalation. This cost escalation is removed in estimating the 2003 dollar impacts.

(4) The B&C Report did not estimate the effect of the 2020 LRDP on stormwater cost impacts.

Source: Brown and Caldwell; Economic & Planning Systems, Inc.

Table 14
Brown and Caldwell Estimates of UC System Sanitary Sewer and Clean Stormwater Costs Projections
UC Berkeley Fiscal Impact Analysis

Cost Category	2015	2016	2017	2018	2019	2020
Nominal Dollar Estimates (1)						
<u>Sewer</u>						
Sewer Service Charges	\$3,134,935	\$3,259,775	\$3,389,465	\$3,524,191	\$3,664,101	\$3,809,443
Hook-Up Fees	<u>\$841,913</u>	<u>\$878,811</u>	<u>\$917,349</u>	<u>\$957,575</u>	<u>\$999,743</u>	<u>\$1,043,705</u>
Total Sewer	\$3,976,849	\$4,138,587	\$4,306,814	\$4,481,766	\$4,663,844	\$4,853,147
<u>Stormwater (2)</u>						
Storm Water Fee	\$166,592	\$171,589	\$176,737	\$182,039	\$187,500	\$193,125
Total Sewer/ StormWater	\$4,143,441	\$4,310,176	\$4,483,551	\$4,663,806	\$4,851,345	\$5,046,273
2003 Dollar Estimates (3)						
<u>Sewer</u>						
Sewer Service Charges	\$2,198,781	\$2,219,748	\$2,240,835	\$2,262,044	\$2,283,347	\$2,304,775
Hook-Up Fees	<u>\$590,501</u>	<u>\$598,428</u>	<u>\$606,476</u>	<u>\$614,631</u>	<u>\$623,007</u>	<u>\$631,459</u>
Total Sewer	\$2,789,282	\$2,818,176	\$2,847,311	\$2,876,675	\$2,906,353	\$2,936,234
<u>Stormwater (2)</u>						
Storm Water Fee (4)	\$116,844	\$116,844	\$116,844	\$116,844	\$116,844	\$116,844
Total Sewer/ StormWater	\$2,906,126	\$2,935,020	\$2,964,155	\$2,993,519	\$3,023,198	\$3,053,078

(1) From Brown and Caldwell, Draft Report, Sewer Service Charges and Connection Fees, and the Clean Stormwater Fees Study for the Evaluation of "Fair Share" contributions from the UC Regents.

(2) The B&C Report did not estimate UC stormwater capital cost impacts.

(3) The Brown and Caldwell calculations assume a 3 percent annual cost escalation. This cost escalation is removed in estimating the 2003 dollar impacts.

(4) The B&C Report did not estimate the effect of the 2020 LRDP on stormwater cost impacts.

Source: Brown and Caldwell; Economic & Planning Systems, Inc.

PUBLIC WORKS / TRANSPORTATION

This section describes the methodology used to calculate UC-related fiscal impacts for transportation facilities and services. These services are provided by a combination of the Public Works and Transportation departments. The section also evaluates Transportation Demand Management (TDM) and parking impacts. As the UC population expands, additional capital and maintenance expenditures will be required to maintain current transportation infrastructure and service standards.

SERVICE DESCRIPTION

The City of Berkeley constructs and maintains virtually all of the roads and pedestrian and bicycle paths in the City. City services include, but are not limited to, street and sidewalk improvement, repair, and cleaning, signalization, construction of traffic calming measures, transit planning, and maintenance of transportation infrastructure. With respect to UC, the most significant impacts to City transportation activities and expenditures are the heavy daily UC-related traffic volumes (vehicular, pedestrian, and bicycle); road wear associated with large-scale construction; and the provision of services specifically tailored to UC, such as circulation design measures, signalization, street and sidewalk maintenance near campus, and pedestrian and bicycle crossing construction and maintenance near campus.

HISTORICAL MITIGATION

UC has not historically made any mitigation payments to offset impacts to construction and maintenance of the City's transportation infrastructure. The only contributions UC has made have been through payment of permit-related cost recovery charges, such as right-of-way and parking meter permit fees in association with long-term construction projects. The Transportation department has specifically requested UC contributions for joint-funding of pedestrian crossings and signalization along the northern campus boundary. To date, UC has not provided any funding for such projects.

FISCAL IMPACT CALCULATION

Discussions with Public Works and Transportation Department staff and a review of available data revealed four primary areas of quantifiable UC fiscal impact. These include: (1) capital costs associated with street improvements; (2) the suite of street, sidewalk, street light, and traffic signal maintenance expenditures around campus; (3) the capital cost of traffic signalization; and (4) Transportation Demand Management measures that serve UC and the City as a whole. The UC fiscal impact on each of these components is described below.

STREET IMPROVEMENTS

Street improvements refer to the capital costs associated with periodic street overlays and reconstruction. Based on interviews with Public Works staff, EPS determined the best way to estimate the street improvement impacts of UC is based on its share of automobile transportation generation, as measured by trips. The results of this analysis are shown in **Table 15** and detailed assumptions and calculations in **Table 16**.

Available data on the commute mode of the UC population (including students, faculty, and staff), as reported in the UC 2020 LRDP Draft EIR, was used to estimate the proportion of the UC population that commutes by automobile, as shown in **Table 16**. About 9,350 of the existing 45,900 UC-related population commute to UC by car, or roughly 20 percent. The 2020 LRDP is expected to add about 5,300 to the UC population, about 2,000 of which are expected to commute by car. The proportion is higher for the 2020 LRDP because the expansion includes a higher percentage of staff (whose propensity to commute by car is significantly above that of the students) and the new population is expected to live further from campus.

The total number of trip ends (each commute has two trip ends, work and home) in the City of Berkeley is about 60,700 based on the City of Berkeley's General Plan. Consistent with our definition of UC, UC-related trip ends are only counted at their arrival at UC, not on their commute home, even if this home is in the City. As a result, at the current time, the UC-related trip ends total 9,350, 15 percent of the total trip ends in the City of Berkeley.

Annual street improvement costs vary by year depending on the particular streets in need of improvement, but over time result in a consistent average. The 2003 capital outlay for street improvements was \$4.9 million, according to the City of Berkeley 2002/2003 budget, equivalent to \$0.22 per trip end. UC's existing 15 percent share of trip ends translates into an annual cost impact of \$755,400. The 2020 LRDP additional annual street improvements costs equal \$163,000 based on the additional trip ends generated and the average cost per trip end.

Table 15
Annual Street Improvement Impacts (2003\$\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
On-Going Costs	--	--	--
Capital Costs	\$755,000	\$164,000	\$919,000
Total	\$755,000	\$164,000	\$919,000

STREETS, SIDEWALKS, STREET LIGHTS, AND TRAFFIC SIGNALS
MAINTENANCE

The UC population creates a need for sidewalk and pedestrian area maintenance, street sweeping, street lighting and traffic system maintenance, and general cleaning, especially in the vicinity of campus. The City Public Works department has estimated these costs based on the citywide unit cost applied to the streets abutting the UC campus, and calculated a total annual cost estimate of approximately \$225,000 attributable to UC. Because these costs are primarily associated with the physical size of the UC campus (e.g., curb and sidewalk miles, etc.), this analysis estimates future costs associated with proposed LRDP development based on the expected growth in total square feet of campus development. As shown in **Table 17**, UC's cost impact is \$225,000 annually at the current time and will increase by \$42,000 each year with the new 2020 LRDP. Detailed calculations of these costs are shown in **Table 18**.

Table 17
Annual Street & Sidewalk Maintenance Impacts (2003\$\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
On-Going Costs	\$225,000	\$42,000	\$267,000
Capital Costs	--	--	--
Total	\$225,000	\$42,000	\$267,000

Table 16
UC Share of Transportation Trips and Street Improvement Costs
Berkeley Fiscal Impact Study

Item	UC				City Total
	Students	Faculty	Staff	Total	
<u>Base Population Data</u>					
2003 UC Population (1)	31,800	1,758	12,377	45,935	--
New 2020 LRDP Population (1)	1,650	220	3,450	5,320	--
<u>Daily Commuters (2)</u>	90%				
2003 UC Population	28,620	1,582	11,139	41,342	--
New 2020 LRDP Population	1,485	198	3,105	4,788	--
<u>UC Commute Mode</u>					
2003 - Drive Alone (3)	10%	51%	51%	--	--
New 2020 - Drive Alone (4)	13%	56%	55%	--	--
<u>UC Auto Commuters (Drive Alone)</u>					
2003 UC Auto Commuters	2,862	807	5,681	9,350	--
New 2020 LRDP Auto Commuters	198	111	1,720	2,029	--
Current UC Share of Daily Trip Ends					
2003 Auto Commute Trip Ends (5)	2,862	807	5,681	9,350	60,693 (6)
UC as % of City Total	5%	1%	9%	15%	100%
Street Improvement Costs					
Annual 2003 Cost	\$231,212	\$65,189	\$458,954	\$755,355	\$4,903,202 (7)
Cost per End Trip					\$0.22 (8)
Annual New LRDP Cost	\$15,956	\$9,006	\$138,967	\$163,929	--

(1) See Table 1.

(2) Assumes a daily attendance of 90 percent to account for vacations, sick leave, and other work absences per Fehr & Peers in University of California, Berkeley, 2020 LRDP Draft EIR, Appendix F-1: Traffic Analysis and Background, page F.1-13.

(3) Factors based on a 2001 faculty/ staff survey and a 2000 student survey, as reported in University of California, Berkeley, 2020 Draft LRDP, Chapter 4: Transportation and Traffic, page 4.12-17.

(4) Based on Fehr and Peers Associates, June 2003, Table F.1-6, 2020 LRDP Person Trip Generation by Mode Choice, Population Segment, and Residence Distance, in University of California, Berkeley, 2020 LRDP Draft EIR, Appendix F-1: Traffic Analysis and Background, page F.1-15. Consistent with the population categorization in this Report, post-docs and visiting scholars are placed into the staff category.

(5) Every commute involves two trips, each with a trip end: the workplace and the place of residence. This analysis only allocates the trip end that occurs at a UC building to the UC share of trip ends; i.e. it does not include any return trips to places of residence in Berkeley.

(6) From February 2001 City of Berkeley Draft General Plan EIR, p126 and p128. The total vehicle trip end estimate for the City of Berkeley in 2020 of 63,979 trips is reduced by the projected 3,286 trip ends from 2005 to 2020 (Fehr & Peers Associates, 1999).

(7) From City of Berkeley Adopted FY 2002/ 2003 Biennial Budget, p243.

(8) Total annual cost divided by total daily trip ends multiplied by 365.

Sources: University of California, Berkeley, 2020 LRDP Draft EIR; City of Berkeley Draft General Plan; Fehr & Peers Associates; City of Berkeley Adopted Budget FY 2002/03; Economic & Planning Systems, Inc.

Table 18
UC-Related Traffic and Road Maintenance Impacts
UC Berkeley Fiscal Impact Analysis

Item	Amount	Methodology	
		Formula	Source
<u>Signalization (Capital)</u>			
Annual signals installed, City-wide	1.0	a	City of Berkeley
Average cost per signal (\$2004)	\$150,000	b	City of Berkeley
Current UC "fair share"	15%	c	UC Berkeley LRDP EIR calculation
UC "fair share" contribution	\$23,108	d = a * b * c	
Current UC service population	28,768	e	Table 6 calculation
Fair share per current UC affiliate	\$0.80	f = e / d	
"Net new" service population	3,960	g	UC Berkeley LRDP EIR calculation
"Net new" UC "fair share" contribution	\$3,181	h = f * g	
Total (2020) "fair share" contribution	\$26,289	i = d + h	
<u>Street & Traffic System Maintenance (Non-capital)</u>			
Street sweeping	\$10,929		City of Berkeley
Sidewalk maintenance	\$67,875		
General cleaning	\$43,559		
Street rehabilitation	\$21,627		
Sidewalk rehabilitation	\$8,712		
Street light system maintenance	\$48,300		
<u>Traffic signal system maintenance</u>	<u>\$24,275</u>		
Current UC "fair share" contribution	\$225,277	j	
Current UC SqFt	14,681,874	k	
Fair share per current 1,000 UC SqFt	\$15.34	l = j / (k/1,000)	
"Net new" UC SqFt	2,778,696	m	Table 4
"Net new" UC "fair share" contribution	\$42,636	n = l * (m/1,000)	calculation
Total (2020) "fair share" contribution	\$267,913	o = j + n	calculation
<u>Transportation Demand Management Program</u>			
Capital costs (one time):			
Transit signage	\$8,000		City of Berkeley
DT bikestation expansion	\$330,000		
Bike/pedestrian streetscaping	\$573,000		
Electronic BART sign (DT)	\$100,000		
Electronic parking signage	\$1,080,000		
<u>Satellite parking</u>	<u>\$150,000</u>		
Subtotal	\$2,241,000	p	
UC "fair share" contribution	\$345,234	q = c * p	calculation
Annualized contribution (15 yrs) (1)	\$31,051	r = q (annualized)	calculation
Total UC service population (2020) (2)	32,728	s	Table 6
Fair share per UC affiliate (2020) (2)	\$0.95	t = r / s	calculation
"Net new" UC fair share contribution	\$3,757	u = t * g	
Current fair share contribution	\$27,294	v = t * e	

Table 18
UC-Related Traffic and Road Maintenance Impacts
UC Berkeley Fiscal Impact Analysis

Item	Amount	Methodology	
		Formula	Source
Non-capital/annual costs:			
TRIP commute store	\$125,000		
TDM evaluation study	\$25,000		
DT bikestation expansion	\$35,000		
Marketing/education	\$20,000		
DT employee EcoPass	\$50,000		
Commuter incentives	\$20,000		
Staffed info kiosk	\$75,000		
Valet parking in City garages	\$204,000		
<u>City ride share</u>	<u>\$190,000</u>		
Subtotal	\$744,000	w	City of Berkeley
UC "fair share" contribution	\$114,616	$x = c * w$	calculation
Fair share per UC affiliate (2020) (2)	\$3.50	$y = x / s$	calculation
"Net new" UC fair share contribution	\$13,868	$z = y * g$	
Current fair share contribution	\$100,747	$aa = y * e$	
<u>Est. Annual UC contribution required</u>			
Capital Costs:			
Current	\$50,402	$bb = d + v$	calculation
<u>Net New</u>	<u>\$6,938</u>	$cc = h + u$	calculation
Total (2020)	\$57,340	$dd = bb + cc$	calculation
Non-capital Costs:			
Current	\$326,024	$ee = j + aa$	calculation
<u>Net New</u>	<u>\$56,504</u>	$ff = n + z$	calculation
Total (2020)	\$382,529	$gg = ee + ff$	calculation

(1) The annual financing costs (principal and interest) from 2005 to 2020 that would fund UC's total "fair share" contribution, assuming a real interest rate of 4.0%.

(2) Divided by total (2020) service population because both existing and future development should contribute to this one-time cost.

Sources: City of Berkeley; Economic & Planning Systems, Inc.

SIGNALIZATION AND TDM PROJECTS

Traffic Signalization

Transportation department staff indicate that approximately one additional intersection signalization occurs each year, at a total cost of roughly \$150,000 per event. Installation of new signals may occur throughout the City, but is most likely to occur in locations characterized by heavy traffic and pedestrian use, which often occur in the vicinity of campus or near other "student nodes." Because these improvements serve the entire Berkeley community, this analysis estimates UC's "fair share" contribution using the traffic allocation methodology described for street improvements described above. Using the 15 percent trip-end "fair share" allocation factor, UC's estimated current annual fiscal impact for traffic signalization is approximately \$23,000, or \$0.80 per current UC service population. "Net new" development under the LRDP is expected to result in an additional cost of approximately \$3,200 per year (see **Table 18**).

Transportation Demand Management (TDM)

City policy emphasizes transportation demand management as a key approach to managing existing and increasing future transportation trips in the City. This analysis estimates UC's "fair share" contributions towards the City's TDM program. The City provided a catalogue of TDM programs and projects designed to improve traffic flow and to reduce automobile transit share across the City. This analysis estimates UC's fair share contribution for these programs based on its relative contribution of automobile trips in the City, 15 percent, as described above. This analysis also assumes that these TDM programs, as envisioned, will serve both current and future development. The programs have been divided between capital and non-capital costs. As shown in **Table 18**, UC's fair share for capital TDM costs is estimated at roughly \$345,000. The annual fiscal impact was estimated by calculating the cost to finance a \$345,000 loan from 2005 to 2020 (the timeframe of the LRDP), assuming a real interest rate of four (4) percent – roughly \$31,000 annually. The annual fair share of non-capital costs is approximately \$114,000 for UC growth through 2020. **Table 17** presents a combined summary of signalization and TDM impacts.

Table 19
Annual Signalization and TDM Impacts (2003\$\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
On-Going Costs	\$159,000	\$22,000	\$181,000
Capital Costs	\$79,000	\$11,000	\$90,000
Total	\$238,000	\$33,000	\$271,000

PARKS AND RECREATION

This section describes the methodology used to calculate UC-related fiscal impacts for facilities and services provided by the City of Berkeley Parks & Recreation Department. As the UC population expands, additional park facilities, equipment, and staffing will be required to maintain current recreation service standards.

SERVICE DESCRIPTION

The City provides a variety of parks and recreational facilities that are open to all, including the UC community. In particular, the City owns and maintains 52 individual parks totaling nearly 300 acres, in addition to numerous tennis courts, swimming pools, a full-service marina, and other recreational facilities. Field and picnic area booking logs as well as anecdotal department staff evidence indicate that UC use — and UC student use in particular — of City-owned park facilities is significant, and results in considerable wear-and-tear to fields and picnic facilities. UC provides a wide range of open space and recreational facilities for its community, including the Recreational Sports Facility (RSF), Kleeberger Field, tennis courts, and a variety of open space. Most of these facilities are not open to the general public (RSF membership to the general public is available at a fee amount equivalent to membership in a private fitness club).

HISTORICAL MITIGATION

UC has never made payments or contributions to the City to offset capital, operational, or maintenance expenditures for parks and recreational facilities, and UC does not pay the City parks assessment or contribute to the financing of the Measure S General Obligation bond (parks maintenance bond) — the main sources of parks and recreation funding in Berkeley.

FISCAL IMPACT CALCULATION

The fiscal impact methodology employed in this report recognizes that UC's existing recreational facilities meet a portion of the demand generated by the UC population, but that a significant amount of "spillover" occurs to the City's parks and recreational facilities. As shown in **Table 20**, the methodology begins by calculating a current "parks & recreation" service population, which includes non-UC residents of Berkeley as well as UC students, faculty, and staff whose recreational needs are not met by UC facilities. No specific information was available from UC or City sources that allowed an accurate calculation of UC park demand met by UC facilities. For the purposed of this analysis it is assumed that two-thirds (2/3) of the demand for park and recreation services and

Table 20
Parks and Recreation Fiscal Impact
UC Berkeley Fiscal Impact Analysis

Item	Amount	Methodology	
		Formula	Source
Current Service Population			
Current city population	106,350	a	City of Berkeley
UC residents of Berkeley	19,398	b	Table 5
Non-UC Berkeley population	86,952	c = a - b	calculation
Current UC "standard" service population (1)			
On-campus residents	11,600	d	Table 6
Off-campus residents (50% discount)	10,100	e	Table 6
Est. UC park demand met by UC facilities	67%	g	EPS
Current UC "parks & rec" service population	7,161	h = (1-g) *(d+e)	
Current Citywide "parks & rec." service population	94,113	i = c + h	
Parks and Recreation Costs			
Annual park maintenance costs			
Landscape Services (2)	\$5,087,077		
<u>Building/Systems O&M</u>	<u>\$962,764</u>		
Sub-total	\$6,049,841	j	City Budget
Annual park capital costs	\$1,616,793	k	City Budget
Park maintenance cost per service pop.	\$64	l = j / i	calculation
Park capital cost per service pop.	\$17	m = k / i	calculation
"Net New" Service Population			
"Standard" service population	2,125	n	Table 6
"Parks & rec" service population	701	o = n * (1-g)	calculation
Current UC Fiscal Impact			
Capital	\$123,021	p = m * h	calculation
<u>Non-Capital</u>	<u>\$460,329</u>	q = l * h	calculation
Total	\$583,349	r = p + q	calculation
"Net New" UC Fiscal Impact			
Capital	\$12,047	s = m * o	calculation
<u>Non-Capital</u>	<u>\$45,078</u>	t = l * o	calculation
Total	\$57,125	u = s + t	calculation
Total UC Fiscal Impact (2020)			
Capital	\$135,068	v = p + s	calculation
<u>Non-Capital</u>	<u>\$505,407</u>	w = q + t	calculation
Total	\$640,475	x = v + w	calculation

(1) UC parks & recreation service population excludes faculty/staff.

(2) Includes forestry services, landscaping services, and fire fuel management costs. Excludes marina.

facilities generated by UC is met by UC facilities. The remaining demand is met by City facilities and programs. This suggests a total service population of 94,113 in the City, 7,160 of which, or about 7.5 percent are associated with UC.

Annual park maintenance and capital facilities costs from the City Budget were used to estimate capital and non-capital costs per “parks service population.” Costs associated with the Berkeley marina were excluded because City staff indicated that UC use of the marina and surrounding facilities represents a minor fraction of total demand. These cost factors were multiplied by current and “net new” (2020 LRDP) UC service populations to yield fiscal impact estimates. **Table 21** below summarizes the results of this analysis and **Table 20** provides the full set of assumptions and calculations.

Table 21
Annual Parks and Recreation Service Impacts (2003\$\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
On-Going Costs	\$460,000	\$45,000	\$505,000
Capital Costs	\$123,000	\$12,000	\$135,000
Total	\$583,000	\$57,000	\$640,000

PLANNING

This chapter describes the methodology used to calculate UC-related fiscal impacts for services provided by the Planning Department. As UC expands in size and population, additional Planning staff time will be required to review development plans and respond to public inquiries regarding campus growth.

SERVICE DESCRIPTION

The City Planning Department devotes significant time and expense to reviewing and responding to a variety of UC-related activities. City efforts include reviewing environmental plans and documents, including: coordination of the public review process; performing CEQA special studies for certain types of development where the City serves as the State-mandated Certified Unified Program Agency (CUPA); monitoring UC mitigation performance following plan adoption; investigating public complaints related to construction and construction management; and reviewing, developing, and enforcing student-related zoning designations.

HISTORICAL MITIGATION

According to Planning Department staff, UC used to provide funding for one full-time senior planning staff position to review UC development plans, respond to citizen inquiries, and act as a liaison between the City and UC. This staff position was eliminated after UC discontinued funding.

UC has also historically made annual payments to the City to offset the City's costs to act as the CUPA agency, to track hazardous materials storage and facilities, and to respond to public inquiries regarding hazardous materials. According to City planning staff, UC's annual payments through 1997 used to adequately cover the City's costs to perform these tasks. In 1997, however, UC significantly reduced its annual payment (from approximately \$60,000 to \$16,000), which no longer adequately covers the City's costs.

FISCAL IMPACT CALCULATION

Planning Department staff indicated that previous UC funding commitments were adequate to offset departmental costs. This analysis therefore estimates the current annual fiscal impact based on costs to restore (1) one full-time senior staff employee to act as a UC liaison and environmental review coordinator and (2) annual payments equivalent to those made prior to 1997 to offset CUPA agency costs.

As shown in **Table 22**, the annual planning position is assumed to cost the City approximately \$100,000 per year (including salary, benefits, and overhead). The \$60,000 annual payment (in 1997 dollars) translates to an equivalent payment of approximately \$74,000 (\$2004), which would cover CUPA-related costs associated with both the UC campus proper and the Lawrence Berkeley National Laboratories (LBNL). No information was available regarding hazardous materials storage and/or inquiries to allocate costs between campus and the LBNL. This report therefore allocated costs based on total acreage, with approximately 85 percent of CUPA-related costs attributed to UC campus proper, or roughly \$65,000 per year. The total estimated current fiscal impact is therefore about \$165,000 annually.

Because planning-related impacts are primarily associated with development, projected fiscal impacts are assumed to correlate with increases in total building area. The current fiscal impact results in a "service demand factor" of approximately \$11.00 per 1,000 sqft of UC development. Using this factor, "net new" growth under the 2020 LRDP is expected to result in additional fiscal costs of approximately \$30,000 per year, or \$192,000 annually by the time LRDP-permitted construction is completed. A summary of these fiscal impact results is shown in **Table 23**, below.

Table 23
Annual Planning Department Impacts (2003\$\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
On-Going Costs	\$165,000	\$38,000	\$203,000
Capital Costs	--	--	--
Total	\$165,000	\$38,000	\$203,000

Table 22
UC-Related Planning Department Impacts
UC Berkeley Fiscal Impact Analysis

Item	Amount	Methodology	
		Formula	Source
UC Planning-Related Impacts (1)			
Required FTE	1.0	a	City Planning
Est. annual FTE cost (\$2004)	<u>\$100,000</u>	b	City Planning
Current annual impact	\$100,000	c = a * b	calculation
UC HAZMAT-Related Impacts (2)			
Annual UC payment through 1997 (3)	\$60,000	d	City Planning
CPI annual increase, 1997-2004	3.44%	e	BLS
2004 Equivalent payment	\$76,029	f = d * (1+e)^7	calculation
Current LBNL acreage	183	g	LBNL website
Total UC acreage	1,232	h	UCB website
Non-LBNL campus (%)	85%	i = (h - g) / h	calculation
Annual UC impact (non-LBNL) (4)	\$64,735	j = f * i	calculation
Total Annual UC Impact (Current)	\$164,735	k = c + j	calculation
Current UC occupied SqFt	12,100,000	l	OLD Table 4
Current impact / 1,000 SqFt	\$13.61	m = k / (l/1,000)	calculation
Projected "Net New" SqFt	2,778,696	n	OLD Table 4
Projected "New New" Impact	\$37,831	o = m * (n/1,000)	calculation
Total Impact (2020)	\$202,566	p = k + o	calculation

- (1) Planning staff indicate that a full-time UC liaison staff member is required to handle UC permitting and environmental review issues, and to respond to citizen inquiries regarding UC development activities.
- (2) As the State-authorized CUPA agency, the City is responsible for cataloguing HAZMAT-related uses on campus and enforcing associated Health & Safety Code issues. In this role the City also responds to citizen-initiated Community Right to Know inquiries and handles other development-related public relations.
- (3) Planning staff indicate that UC made annual payments of \$60,000 through 1997 to off-set HAZMAT-related impacts. City staff considered this payment sufficient to cover its costs, so is used as the basis for this impact calculation.
- (4) LBNL was excluded from this calculation because the 2020 LRDP does not address future LBNL development.

BLS - U.S. Bureau of Labor Statistics
 LBNL - Lawrence Berkeley National Laboratory
 UCB - UC Berkeley

Sources: City of Berkeley; Economic & Planning Systems, Inc.

HEALTH AND HUMAN SERVICES

This chapter describes the methodology used to calculate UC-related fiscal impacts for services provided by the Health and Human Services Department. As UC expands in size and population, additional staffing resources may be required to provide current levels of public health services to City and UC populations.

SERVICE DESCRIPTION

The City Health and Human Services (HHS) Department operates a number of inspection, support, and outreach programs that support a safe and healthy environment for City and UC residents. Functions include infectious disease control and disaster planning. HHS provides a variety of services that are accessible to UC students and faculty – family planning, HIV/AIDS counseling, public health clinic, sexually transmitted and infectious disease counseling, tobacco prevention, tuberculosis control, and crisis response – some of which are supported by UC health services, by City and UC police, and by City fire/EMS staff. The Environmental Health Division of the HHS department provides inspection and environmental control services that directly benefit and/or respond to the UC population, and that are not provided by other agencies. Examples include restaurant and water supply inspections, vector control, noise and smoking ordinance enforcement, and abandoned vehicle and blighted property abatement.

HISTORICAL MITIGATION

UC has not historically made any mitigation payments to support HHS programs or services.

FISCAL IMPACT CALCULATION

The primary fiscal impact associated with UC involves infectious disease control and environmental health services provided by the HHS department.¹¹ **Table 24** presents a summary of estimated annual events and HHS staff time spent addressing and/or

¹¹ Staff from other HHS divisions, such as Employment and Special Event Permitting, noted potential impacts that may be associated with UC and/or future development, but impacts are not estimated as they were deemed either negligible or impossible to accurately quantify. In particular, the Employment Division noted its desire for UC to participate more fully in City programs designed to increase employment opportunities for local and/or at-risk populations. While a program goal worthy of mention, the fiscal impact of UC's lack of participation was unclear.

Table 24
UC-Related Health and Human Services (HHS) Service Demand
UC Berkeley Fiscal Impact Analysis

Item	Annual Events	Avg. Staff Time Per Event (Hrs)	Current Hours	Method	Allocation Current	Net New	Net New Hours
Formula:	a	b	c=a *b	--	d	e	f=c*(e/d)
Source:	HHS	HHS	EPS	EPS	OLD Table 4	OLD Table 4	EPS
Vector control	138	1	138	SqFt	14,681,874	2,778,696	26
Abandoned vehicles	9	2	18	Service Pop.	28,768	3,960	2
General environmental health	4	1	4	SqFt	14,681,874	2,778,696	1
Noise complaint investigations	25	2	50	Service Pop.	28,768	3,960	7
Smoking complaint investigations	9	1	5	Service Pop.	28,768	3,960	1
<u>Water sampling/sewage</u>	<u>40</u>	<u>1</u>	<u>40</u>	Service Pop.	28,768	3,960	<u>6</u>
Subtotal	225		255				42

(1) As reported by the Environmental Health department. UC-related impacts to other HHS departments were noted but information was not available to allow quantification of impacts. See report text for a discussion of these other impacts.

Sources: City of Berkeley; Economic & Planning Systems, Inc.

responding to environmental health issues related to the UC campus and population. Depending on whether HHS services better correlate with physical development (e.g., vector control) or population (e.g., noise complaints), these labor estimates were used to project future staff hours required to accommodate “net new” growth under the proposed LRDP. The current HHS staff billing rate (\$120 per hour) was used to calculate current and “net new” environmental health service fiscal impact estimates of \$31,000 and \$5,000, respectively, as shown in **Table 25**. The annual City expenditure on communicable disease control, provided by City staff, totals \$500,000, with a current UC cost impact of \$122,300 based on its service population share of 24 percent. Growth in the UC’s service population will add \$16,800 in additional costs assuming similar per service population costs (see **Table 25**). The total estimated annual impact once all LRDP-approved development is completed is approximately \$175,000. A summary of these fiscal impact results is shown in **Table 26**, below.

Table 26
Annual Health & Human Services Impacts (2003\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
On-Going Costs	\$153,000	\$22,000	\$175,000
Capital Costs	--	--	--
Total	\$153,000	\$22,000	\$175,000

Table 25
UC-Related Health and Human Services (HHS) Fiscal Impacts
UC Berkeley Fiscal Impact Analysis

Item	Amount	Methodology	
		Formula	Source
<u>Current Annual Impacts</u>			
Communicable Disease Control:			
Current CDC Annual Spending, City-wide	\$500,000		HHS
UC Service Population %	24%		Table 6
UC current "fair share" CDC costs	\$122,297		
Other HHS functions:			
Annual staff time	255 hours	a	Table 24
Departmental billing rate (2004-'05)	\$120	b	HHS Dept.
UC current "fair share" other HHS costs	\$30,540		
Current Annual Cost	\$152,837	c = a * b	calculation
<u>Estimated "Net New" Costs</u>			
Communicable Disease Control:			
Percent UC service population growth	14%		
"Net new" CDC annual fair share	16,835		
Other HHS functions:			
"Net new" staff time, other HHS functions	42 hours	d	Table 24
"Net new" HHS other costs	\$5,083		
"Net New" Annual Cost	\$21,918	e = b * d	calculation
Estimated total impact (2020)	\$174,755	f = c + e	calculation

(1) Based on occupied Academic & Support square feet (OLD Table 4) plus campus beds (Table 5), assuming 223 SqFt per bed.

Sources: City of Berkeley; Economic & Planning Systems, Inc.

SUMMARY OF TOTAL FISCAL IMPACTS

As summarized in **Table 27**, the total annual fiscal impact currently generated by UC population and facilities is estimated to be \$13.5 million. About 20 percent of this amount is associated with sewer and stormwater services, about 20 percent with other capital costs, and about 60 percent with other ongoing costs. The additional annual fiscal impact associated with “net new” development under the 2020 LRDP is estimated to be \$1.96 million.

Once all LRDP-approved development is completed, and assuming UC makes no mitigation payments, this report estimates that the City will incur annual fiscal costs of approximately \$15.4 million each year to provide facilities and services for UC in 2003 dollar terms. A more detailed summary of costs by department is presented in **Table 28**.

Table 27
Total Annual Fiscal Impacts (2003\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
On-Going Costs	\$8,100,000	\$1,111,000	\$9,054,000
Capital Costs (1)	\$2,676,000	\$423,000	\$3,099,000
Sewer/ Stormwater Costs	\$2,697,000	\$424,000	\$3,122,000
Total	\$13,475,000	\$1,959,000	\$15,434,000

(1) Capital costs include infrastructure improvement, capital facility, vehicles, and major equipment costs.

Table 28
Summary of Annual Fiscal Impacts (2003 Dollars)
UC Berkeley Fiscal Impact Analysis

Public Service Category	Current Annual Impact				Net New Annual Impact			
	Capital (1)	Non-capital	Sewer/ Stormwater	Total	Capital (1)	Non-capital	Sewer/ Stormwater	Total
Fire	\$1,673,160	\$4,087,311	--	\$5,760,471	\$230,319	\$562,640	--	\$792,960
Police	\$74,427	\$2,909,716	--	\$2,984,143	\$10,245	\$387,890	--	\$398,135
Public Works (Wastewater/ Stormwater) (1)	--	--	\$2,697,818	\$2,697,818	--	--	\$423,760	\$423,760
Public Works/ Transportation	\$805,757	\$326,024	--	\$1,131,781	\$170,867	\$56,504	--	\$227,371
Parks and Recreation	\$123,021	\$460,329	--	\$583,349	\$12,047	\$45,078	--	\$57,125
Planning	\$0	\$164,735	--	\$164,735	\$0	\$37,831	--	\$37,831
Health and Human Services	\$0	\$152,837	--	\$152,837	\$0	21,918	--	\$21,918
Total	\$2,676,364	\$8,100,953	\$2,697,818	\$13,475,135	\$423,478	\$1,111,861	\$423,760	\$1,959,100

(1) Capital costs include infrastructure, facility, vehicle, and major equipment costs.

(2) Also includes solid waste impacts.

Sources: City of Berkeley; Economic & Planning Systems, Inc.

Table 28
Summary of Annual Fiscal Impacts (2003 Dollars)
UC Berkeley Fiscal Impact Analysis

Public Service Category	Total (2020) Annual Impact			
	Capital (1)	Non-capital	Sewer/ Stormwater	Total
Fire	\$1,903,479	\$4,649,951	--	\$6,553,431
Police	\$84,672	\$3,297,606	--	\$3,382,278
Public Works (Wastewater/ Stormwater) (1)	--	--	\$3,121,578	\$3,121,578
Public Works/ Transportation	\$976,624	\$382,529	--	\$1,359,152
Parks and Recreation	\$135,068	\$505,407	--	\$640,475
Planning	\$0	\$202,566	--	\$202,566
Health and Human Services	\$0	\$174,755	--	\$174,755
Total	\$3,099,843	\$9,212,814	\$3,121,578	\$15,434,235

(1) Capital costs include infrastructure, facility, vehicle, and major equipment costs.

(2) Also includes solid waste impacts.

Sources: City of Berkeley; Economic & Planning Systems, Inc.

CITY REVENUES GENERATED BY UC ACTIVITIES

In addition to fiscal costs generated by UC facilities and population, UC also generates some direct revenues that accrue to the City. As a tax-exempt entity, UC does not pay many of the typical revenue sources the City generally receives from private land owners and businesses – these are the focus of **Chapter IV**. This chapter estimates the direct revenues, including sales tax revenues and population-driven revenues. Consistent with the definition of UC used for cost estimation in this Report, it does not evaluate indirect or “downstream” revenue impacts associated with UC’s presence in the City of Berkeley. It also does not estimate revenues that simply offset City costs that were not estimated above. The revenues generated are shown in **Table 29** and described below.

Table 29
Annual Revenues Generated (2003\$\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
Sales Tax	\$1,314,000	\$185,000	\$1,499,000
Auto. In-Lieu	\$315,000	\$70,000	\$385,000
Gas Tax	\$472,000	\$106,000	\$578,000
Total	\$2,101,000	\$361,000	\$2,462,000

SALES TAX REVENUES

The UC population will spend a portion of its income on taxable goods and services in the City of Berkeley. In addition, the UC itself will purchase goods and services from vendors located in the City. The City receives 1 percent of most of these sales as sales tax revenues.

The evaluation of sales tax revenues generated by the UC in the City of Berkeley is shown in **Table 30**. The three different segments of the UC population, including on-campus students, off-campus students, and faculty/ staff, all generate different levels of taxable sales per capita. As discussed above, students residing on campus are assumed to be present in and around UC all of their time, off-campus students for half of their time, and faculty/ graduates during working hours.

The UC Economic Impact Study provided estimates of annual expenditures by on-campus students in 1998/9 dollars.¹² These estimates were converted into 2003 dollars using the consumer price index. Off-campus students UC-related expenditures were assumed to be precisely half the on-campus student expenditures. UC faculty/ staff were treated similar to office workers, who generally spend about \$8 each working day on food and miscellaneous goods and service.

UC directly spent \$602 million on goods, services, and construction in the fiscal year 1998/9, about 11.4 percent of which, or \$68.5 million, was spent at vendors in the City of Berkeley. A full list of the vendors and sales was not available. This set of expenditures was converted into 2003 dollars and discounted by 25 percent to account for expenditures that were not on taxable items or where the sales tax revenue did not accrue to the City of Berkeley.

The resulting sales tax estimates include the generation of about \$1.31 million annually in sales tax revenues by UC at the current time. An additional \$185,000 annually will be accrued by the buildout of the LRDP (see **Table 30**).

MOTOR-VEHICLE IN-LIEU FEE/ GAS TAX

The motor-vehicle and gas taxes are all distributed by the State based on population. The current per capita revenue allocations include \$40.50 in motor vehicle in-lieu fees, and \$40.72 in gas taxes. There is significant uncertainty over the motor vehicle in-lieu tax at the current time, with the possibility that revenues may be cut by two-thirds or made whole through the redistribution of revenues from other local sources. This analysis takes a middle ground and assumes the per capita payment is cut by one-third to \$27.15. Applying these factors to the existing on-campus UC population results in an annual total revenue of \$787,000, including \$472,000 from the gas tax and \$315,000 from the motor vehicle in-lieu fees. Applying these same factors to growth under the 2020 LRDP results in an \$176,000 in new annual revenues, including \$106,000 in gas taxes and \$70,000 in motor vehicle in-lieu fees (see **Table 31**).

¹² From Sedway Group, "Building the Bay Area's Future: A Study of the Economic Impact of the University of California, Berkeley", 2001.

Table 30
Sales Tax Revenues generated by UC
UC Berkeley Fiscal Impact Analysis

Item	On-Campus Students	Off-Campus Students	Faculty/ Staff	UC Direct Purchasing	UC Total
<u>Population Assumptions</u>					
Existing UC Population	11,600	20,200	14,135	--	25,735
Additional 2020 LRDP Population	<u>2,600</u>	<u>-950</u>	<u>3,670</u>	--	<u>6,270</u>
2020 Total	14,200	19,250	17,805	--	32,005
<u>Retail Expenditure Assumptions</u>					
Annual Retail Expenditure per Capita	\$2,060 (1)	\$1,030 (2)	\$2,000 (3)	--	\$4,060
<u>UC-Generated Taxable Sales</u>					
Current Taxable Sales	\$23,896,000	\$20,806,000	\$28,270,000	\$58,493,043 (4)	\$131,465,043
Additional 2020 LRDP Sales	<u>\$5,356,000</u>	<u>-\$978,500</u>	<u>\$7,340,000</u>	<u>\$6,774,420 (5)</u>	<u>\$18,491,920</u>
Total 2020 Sales	\$29,252,000	\$19,827,500	\$35,610,000	\$65,267,464	\$149,956,964
<u>UC-Generated Sales Tax</u>					
Current City Sales Tax	\$238,960.00	\$208,060.00	\$282,700.00	\$584,930.43	\$1,314,650.43
Additional 2020 LRDP Sales Tax	<u>\$53,560.00</u>	<u>-\$9,785.00</u>	<u>\$73,400.00</u>	<u>\$67,744.20</u>	<u>\$184,919.20</u>
Total 2020 Sales Tax	\$292,520.00	\$198,275.00	\$356,100.00	\$652,674.64	\$1,499,570

(1) The UC Economic Impact Study reports an expenditure of \$1,812 each year by on-campus students in 1998/9 , excluding on-campus housing and meal plans, registration and fees, books and supplies, and non-resident tuition. Assuming that all these sales are taxable and occur in the City of Berkeley and converting the expenditures

into 2003 dollars based on the consumer price index, the annual taxable student expenditure is \$2,060.

(2) Off-campus students are assumed to spend half of their time in and around the campus. As a result, their UC-related taxable expenditures are assumed to be half those of the on-campus students.

(3) Faculty, staff, and other UC population are considered similarly to standard office workers. It is therefore assumed that they spend about \$8 each day on eating out and other miscellaneous purchases. Assuming that they work 250 days each year, this results in an annual expenditure of \$2,000 each year.

(4) Based on the UC Economic Impact Study estimate of \$68.5 million of direct UC expenditures on goods, services, and construction in the City of Berkeley in 1998/9; inflated into 2003 dollars using the consumer price index; discounted by 25 percent to account for sales that do not generate sales taxes for the City of Berkeley.

(5) Increase based on growth in overall UC population.

Sources: 2020 LRDP; Sedway Group; UC Economic Impact Study; UC Berkeley Financial Aid Office; EPS

Table 31
Gas and Auto In-Lieu Tax Revenues generated by UC
UC Berkeley Fiscal Impact Analysis

Item	Gas Taxes	Auto In-Lieu	Total
<u>Population Assumptions</u>			
2003 City Population	106,350	106,350	106,350
Existing On-Campus Pop.	11,600	11,600	11,600
Additional 2020 LRDP Pop.	2,600	2,600	2,600
<u>Current Revenues/ Ratios</u>			
Current Annual Revenues	\$4,331,060	\$4,306,748	\$8,637,808
Source	Actual 2002	Adopted 1993	--
Per City Capita Revenue	\$40.72	\$40.50	\$81.22
Adjusted Per Capita (1)	\$40.72	\$27.15	\$67.87
<u>UC-Generated Revenues</u>			
Current Revenues	\$472,405	\$314,937	\$787,342
2020 LRDP Revenues	<u>\$105,884</u>	<u>\$70,589</u>	<u>\$176,473</u>
Total 2020 Revenues	\$578,289	\$385,526	\$963,815

(1) Assumes that auto in-lieu taxes are two-thirds their historical levels.
Source: Berkeley City Budget; EPS

NET FISCAL IMPACT

In its simplest form, the “net” fiscal impact of UC on the City of Berkeley is the difference between total revenues received by the City and the total costs the City incurs to provide facilities and services to UC. As described above, the total current annual impact associated with UC is estimated at approximately \$13.4 million, while total annual revenues accruing from UC are approximately \$2.1 million. The current net fiscal impact on the City of providing services and infrastructure to UC is therefore approximately negative \$11.3 million per year in 2003 dollar terms.

Proposed development under the LRDP is estimated to produce revenues to the City of approximately \$400,000 annually, while the cost of providing service to net new development is expected to cost the City approximately \$2.0 million annually. The net fiscal impact associated with new development is therefore estimated to be negative \$1.6 million annually in 2003 dollar terms.

By the time proposed development under the LRDP is complete, this analysis estimates that the City will incur annual fiscal losses of approximately \$12.8 million. These results are summarized below in **Table 32**.

Table 32
Net Annual Fiscal Impact (2003\$)
UC Berkeley Fiscal Impact Analysis

	Current	2020 LRDP	Total 2020
Annual Revenues	\$2,100,000	\$400,000	\$2,500,000
Annual Costs	\$13,500,000	\$2,000,000	\$15,500,000
Net Fiscal Impact	(\$11,400,000)	(\$1,600,000)	(\$13,000,000)

IV. REVENUE APPROACH

Chapter III calculates the estimated annual costs each City department incurs to serve UC population and facilities, as well as any estimated revenues the City receives from UC activities. These two values are combined to provide a total estimate of net annual UC fiscal impact on the City currently and under the proposed LRDP development program. This chapter presents an alternative approach to estimating the fiscal impact of UC on the City by calculating the total revenues the City does not receive from UC because of its status as a tax exempt entity. In essence, this calculation answers the question, “how much additional revenue would the City receive if UC were a private entity?” It is important to note that the results presented in this chapter and in **Chapter III** are not additive; they are meant as alternative and complementary approaches that should be evaluated independent from one another.

Results of these lost revenue calculations are presented in **Tables 33** and **34**. **Table 33** shows the lost revenue calculations where lost revenues are discounted using a UC share factor. **Table 34** shows the results without the discount. The UC share factors applied differ by revenue category and are described in more detail below. In general, they are meant to reflect the fact that UC may already provide facilities or services that duplicate those supported by the funding mechanism in question. For example, it can be argued that a UC student does not generate the same demand for municipal library services as a typical Berkeley resident because UC provides its own library facilities (that student may still use City libraries, however, but to a lesser degree than a typical resident).

PROPERTY TAX

As a tax-exempt entity, UC does not pay property tax on any property it occupies. This includes land and properties it owns and occupies, as well as property it leases from private landowners. Were UC subject to property tax collection, as are most non-public landowners in the City of Berkeley, the City would receive approximately 32 percent of the Proposition 13-mandated one percent property tax collected annually by the County Tax Assessor/Auditor. The fiscal impact on the City government of this lost property tax revenue is significant. UC is one of the largest landowners/tenants in Berkeley, and many of the City facilities and services described in **Chapter III** are funded in large part from property tax revenues (i.e., the City’s General Fund).

As described in **Chapter II** and shown in **Table 4**, at the current time, UC includes 11,600 beds and 12.1 million square feet of academic and support space. The proposed LRDP outlines construction of approximately 2,600 new beds and 2.2 million new sqft of academic and support space, representing a 22 percent and 18 percent increase over current levels, respectively. The LRDP does not specify or address whether these new facilities will be constructed on land already owned by UC, or whether UC will acquire

Table 33
Lost Revenue Estimate (with UC share factor)
UC Berkeley Fiscal Impact Analysis

Public Service Category	Funding Mechanism	Amount / Rate			UC Share Factor (1)	Annual UC Contribution Forgone (2)		
		Residential	Institutional	Unit		Current	Net New	Total (2020)
<u>Voter-Approved Assessments and Special Taxes</u>								
Street Lighting	Assessment	\$0.0108	\$0.0108	/BSF	50%	\$79,282	\$15,005	\$94,287
Library - Measure E	Tax	\$0.1292	\$0.1956	/BSF	10%	\$270,034	\$50,509	\$320,543
Berkeley Unified School District (BUSD)								
Class Size - Measure H	Tax	\$0.1229	\$0.1844	/BSF	10%	\$254,855	\$47,680	\$302,535
School Facility Maint. - Measure BB	Tax	\$0.0475	\$0.0713	/BSF	10%	\$98,537	\$18,435	\$116,972
Paramedic Service - Measure B	Tax	\$0.0261	\$0.0261	/BSF	100%	\$383,373	\$72,557	\$455,930
Severely Disabled Fee - Measure E	Tax	\$0.0093	\$0.0093	/BSF	100%	\$136,688	\$25,870	\$162,558
General Obligation Bonds - City								
Measure G (Disaster Preparedness)	Ad Valorem	0.030%	0.030%	of AV	100%	\$571,802	\$136,790	\$708,592
Measure S (Seismic Tax)	Ad Valorem	0.043%	0.043%	of AV	33%	\$267,317	\$63,949	\$331,267
Warm Water Pool	Ad Valorem	0.0035%	0.0035%	of AV	33%	\$22,014	\$5,266	\$27,281
Animal Shelter	Ad Valorem	0.0075%	0.0075%	of AV	10%	\$14,295	\$3,420	\$17,715
General Obligation Bonds - BUSD								
Measure A/ AA	Ad Valorem	0.1728%	0.1728%	of AV	10%	\$329,358	\$78,791	\$408,149
New Measure	Ad Valorem	0.0320%	0.0320%	of AV	100%	\$609,922	\$145,909	\$755,831
Parks - Measure A	Assessment	\$0.0983	\$0.0983	/BSF	33%	\$476,314	\$90,147	\$566,461
Fire Equipment - Measure Q	Mello Roos	\$0.0125	\$0.0125	/BSF	100%	\$183,523	\$34,734	\$218,257
Subtotal						\$3,697,316	\$789,062	\$4,486,378
<u>Other Taxes</u>								
Transient Occupancy Tax (3)	City tax		12.0%	/room	--	\$62,698	\$0	\$62,698
Parking Lot Tax (4)	City tax		10.0%	/space	--	\$932,753	\$282,281	\$1,215,034
Subtotal (5)						\$995,451	\$282,281	\$1,277,732
Tax Subtotal (w/o Property Tax)						\$4,692,767	\$1,071,343	\$5,764,110
Property Tax (City share) (6)	Ad Valorem	0.32%	0.32%	of AV	--	\$6,099,223	\$1,459,092	\$7,558,315
Total w/ Property Tax						\$10,791,990	\$2,530,435	\$13,322,425

- (1) This factor accounts for facilities/services funded by voter-approved mechanisms that the UC already provides.
- (2) See Table 5 for residential projections (square foot calculations assume 223 SF per bed), and *for academic and support space projections.
Ad valorem calculations assume assessed values of \$209 per new residential square foot and \$152 per new academic and support square foot.
Ad valorem calculations assume assessed values of \$167 per existing residential square foot and \$122 per existing academic and support square foot.
- (3) Current estimate based on 22 faculty club rooms, assuming 60% annual occupancy and an average room rate of \$108. Assumes LRDP does not include any lodging space.
- (4) Assumes 50% of spaces are fully occupied by student/faculty annual parking pass holders (at an average cost of \$119 per year). Remaining spaces are fully occupied 9 months of the year, at an average daily rate of \$8.00.
- (5) The City's utility users tax has also not been included due to a lack of information.
- (6) Current property tax forgone was not calculated due to the difficulty of tracking when various UC buildings were constructed and/or most recently improved/sold.
Assumes City receives 32% of the 1.0% property tax.
BSF = Building Square Foot; AV = Assessed Value.
Sources: City of Berkeley; Economic & Planning Systems, Inc.

Table 34
Lost Revenue Estimate (full valuation as non-exempt institution)
UC Berkeley Fiscal Impact Analysis

Public Service Category	Funding Mechanism	Amount / Rate			UC Share Factor (1)	Annual UC Contribution Forgone (2)		
		Residential	Institutional	Unit		Current	Net New	Total (2020)
<u>Voter-Approved Assessments and Special Taxes</u>								
Street Lighting	Assessment	\$0.0108	\$0.0108	/BSF	100%	\$158,564	\$30,010	\$188,574
Library - Measure E	Tax	\$0.1292	\$0.1956	/BSF	100%	\$2,700,338	\$505,088	\$3,205,426
Berkeley Unified School District (BUSD)								
Class Size - Measure H	Tax	\$0.1229	\$0.1844	/BSF	100%	\$2,548,552	\$476,802	\$3,025,354
School Facility Maint. - Measure BB	Tax	\$0.0475	\$0.0713	/BSF	100%	\$985,369	\$184,348	\$1,169,717
Paramedic Service - Measure B	Tax	\$0.0261	\$0.0261	/BSF	100%	\$383,373	\$72,557	\$455,930
Severely Disabled Fee - Measure E	Tax	\$0.0093	\$0.0093	/BSF	100%	\$136,688	\$25,870	\$162,558
General Obligation Bonds - City								
Measure G (Disaster Preparedness)	Ad Valorem	0.030%	0.030%	of AV	100%	\$571,802	\$136,790	\$708,592
Measure S (Seismic Tax)	Ad Valorem	0.043%	0.043%	of AV	100%	\$810,053	\$193,786	\$1,003,839
Warm Water Pool	Ad Valorem	0.0035%	0.0035%	of AV	100%	\$66,710	\$15,959	\$82,669
Animal Shelter	Ad Valorem	0.0075%	0.0075%	of AV	100%	\$142,951	\$34,197	\$177,148
General Obligation Bonds - BUSD								
Measure A/ AA	Ad Valorem	0.1728%	0.1728%	of AV	100%	\$3,293,580	\$787,910	\$4,081,490
New Measure	Ad Valorem	0.0320%	0.0320%	of AV	100%	\$609,922	\$145,909	\$755,831
Parks	Assessment	\$0.0983	\$0.0983	/BSF	100%	\$1,443,375	\$273,174	\$1,716,549
Fire Equipment	Mello Roos	\$0.0125	\$0.0125	/BSF	100%	<u>\$183,523</u>	<u>\$34,734</u>	<u>\$218,257</u>
Subtotal						\$14,034,802	\$2,917,132	\$16,951,934
<u>Other Taxes</u>								
Transient Occupancy Tax (3)	City tax		12.0%	/room	--	\$62,698	\$0	\$62,698
Parking Lot Tax (4)	City tax		10.0%	/space	--	<u>\$932,753</u>	<u>\$282,281</u>	<u>\$1,215,034</u>
Subtotal (5)						\$995,451	\$282,281	\$1,277,732
Tax Subtotal (w/o Property Tax)						\$15,030,253	\$3,199,413	\$18,229,666
Property Tax (City share) (6)	Ad Valorem	0.32%	0.32%	of AV	--	\$6,099,223	\$1,459,092	\$7,558,315
Total w/ Property Tax						\$21,129,476	\$4,658,505	\$25,787,981

(1) Assumes UC does not receive credit for any of the facilities/ services it provides.

(2) See for residential projections (square foot calculations assume SF per bed), and "for academic and support space projections.

Ad valorem calculations assume assessed values of \$ per new residential square foot and \$ per new academic and support square foot.

Ad valorem calculations assume assessed values of \$ per existing residential square foot and \$ per existing academic and support square foot.

(3) Current estimate based on 22 faculty club rooms, assuming 60% annual occupancy and an average room rate of \$108. Assumes LRDP does not include any lodging space.

(4) Assumes 50% of spaces are fully occupied by student/faculty annual parking pass holders (at an average cost of \$119 per year). Remaining spaces are fully occupied

9 months of the year, at an average daily rate of \$8.00.

(5) The City's utility users tax has also not been included due to a lack of information.

(6) Current property tax forgone was not calculated due to the difficulty of tracking when various UC buildings were constructed and/or most recently improved/sold.

Assumes City receives 32% of the 1.0% property tax.

BSF = Building Square Foot; AV = Assessed Value.

Sources: City of Berkeley; Economic & Planning Systems, Inc.

new land for construction. To the extent that new LRDP growth occurs on land that is currently privately owned, additional parcels will be taken off the County tax rolls, causing the City to lose property tax revenue that it currently receives. Finally, were UC not tax-exempt, the proposed LRDP construction would increase the property value of each parcel on which development occurs, which would generate additional property tax revenue to partially offset the City's costs to provide services to those new facilities. Under the current tax structure, however, new growth creates new demand for services (see **Chapter III**) but does not yield additional funding to provide those services.

Table 33 presents an estimate of annual property tax revenues the City would receive from both existing property and the proposed LRDP development if UC were not tax exempt – approximately \$7.5 million, including \$6 million from existing property and \$1.5 from new LRDP development at buildout. The calculation for the new LRDP assumes finished average residential and nonresidential property values of about \$210 and \$150 per building square foot, respectively. These property values were estimated assuming an average gross land value of \$1.2 to \$1.5 million per acre, a gross-to-net factor of 85 percent (to account for sidewalks, landscaping, parking, and other infrastructure), and vertical construction costs of \$168 and \$120 per building sqft for residential and nonresidential, respectively. Calculations for the existing property used the same set of assumptions, though property value estimates were discounted by 20 percent as a proxy for the effects of Proposition 13.¹³

VOTER-APPROVED ASSESSMENTS AND AD VALOREM TAX

In addition to the one percent property tax, Berkeley voters have approved a number of assessments and taxes to fund a variety of programs. These taxes and assessments are typically calculated and collected annually in conjunction with landowners' property tax bills, and represent an additional source of revenue the City does not receive from UC. Voter-approved assessments and Mello-Roos taxes are calculated based on building square footage, while ad valorem tax is calculated as a percentage of total assessed value. **Table 33** shows a catalogue of assessments, Mello-Roos special taxes, and ad valorem taxes levied in Berkeley, including the tax rate by property type. Each assessment or tax was approved by voters to fund a specific suite of programs or services, and revenues can only be used in a manner consistent with that fund's mandate.

As mentioned above, UC currently provides infrastructure and services that overlap with the voter-approved revenue mechanisms. **Table 33** estimates lost revenues associated with UC's tax exempt status by first estimating UC's "fair share" contribution to each funding category. Each assessment or tax category assumes a share factor,

¹³ A more accurate estimate of current UC property values requires an inventory of UC property and improvements, including facility type and date of construction (or most recent sale/improvement). Proposition 13, passed in 1978 mandated that assessed values can increase by a maximum of 2% per year (unless the property is improved or sold).

which takes into account the degree to which UC facilities and services meet UC student/faculty demand for those services. Categories where UC currently provides services to offset demand—library, parks, and street lighting—were assigned share factors of 10 percent, 33 percent, and 50 percent, respectively. Categories associated with schools, where the UC population's demand for services is expected to differ from typical Berkeley residents, were assigned a share factor of 10 percent. UC was assumed to share the same share portion for all remaining categories as other Berkeley landowners, or an assumed factor of 100 percent.

As shown in **Table 33**, this analysis estimates that if UC were not tax exempt it would currently be responsible for approximately \$3.7 million in annual payments associated with voter-approved assessments, Mello-Roos special taxes, and ad valorem taxes. Projected growth under the proposed LRDP would result in an additional annual payment of approximately \$790,000 if UC were not tax exempt. By the time LRDP construction is complete, this analysis estimates the City will lose roughly \$3.7 million annually from voter-approved mechanisms alone due to UC's tax exempt status. **Table 34** shows the annual revenues lost if a UC share factor did not apply. In this case, the annual losses include \$14.4 million at the current time and \$3.0 million once the new LRDP is built out.

OTHER TAXES AND REVENUES

The City of Berkeley collects transient occupancy tax (TOT) from privately owned lodging establishments and parking lot taxes from privately owned parking lots and garages. As a tax exempt entity, UC does not pay either of these taxes.

TRANSIENT OCCUPANCY TAX

The City of Berkeley charges a 12 percent TOT on all lodging sales at private establishments within the City. UC currently owns and operates one lodging facility—the 22-room faculty club in the center of campus—and does not pay the City's TOT. Faculty club staff indicate that the average annual occupancy rate is approximately 60 percent, and that room prices range from \$50 to \$175 per night. The average room rate across all rate classes is \$108 per night. Based on these assumptions, this analysis estimates that annual room revenue at the faculty club is approximately \$520,000, which would result in annual TOT revenue of about \$62,000 per year if UC were not tax exempt, as shown in **Table 33**.

The LRDP does not provide any project specific information that describes whether proposed development is expected to include additional lodging facilities. This analysis therefore does not calculate future TOT revenue forgone in association with UC-owned lodging facilities. It should be noted that if the proposed hotel and conference facility in downtown Berkeley is owned and/or operated by UC, and is constructed in association

with projected growth under the LRDP, this would represent a potential additional source of lost TOT revenue to the City.

PARKING LOT TAX

The City of Berkeley currently charges a 10 percent parking tax on all parking charges levied by private operators. As shown in **Table 4**, UC currently operates 7,600 parking spaces and has proposed to add an additional 2,300 spaces in association with the LRDP. No estimates were available regarding total parking revenues collected by UC on its parking lots and structures. This analysis assumes that 50 percent of current and future spaces are occupied entirely by student and faculty annual parking permit holders. According to the UC parking website, annual faculty and student parking permits sell for \$75 and \$138, respectively. This analysis assumes that all remaining parking spaces are occupied 80 percent of the time at an average daily parking charge of \$8.00 (equal to the pre-paid parking booklet daily rate).

Based on these assumptions, this analysis estimates that current UC parking spaces generate annual revenues of approximately \$9.3 million, and that proposed “net new” parking spaces will generate about \$2.8 million annually. As shown in **Table 33**, this produces an estimate that the City currently loses approximately \$933,000 annually, and will lose an additional \$282,000 annually, in parking lot tax due to UC’s tax exempt status.

TOTAL LOST REVENUE

As summarized in **Table 33**, total current lost tax and assessment revenue is estimated to be approximately \$10.8 million annually, including \$6.1 million in property taxes, \$3.7 million in assessments and special taxes, and \$1.0 million in other taxes. Lost revenue associated with projected “net new” growth under the proposed LRDP is estimated to result in an additional \$2.5 million in annual lost revenue, including \$1.5 million in property taxes, \$800,000 in assessments and special taxes, and \$300,000 in other taxes. As mentioned above, if UC acquires land that is currently privately owned to construct LRDP projects, the City’s total lost tax revenue would also include whatever the City currently receives in property tax and assessments from those parcels acquired from private sellers.

NON-PROFIT EVALUATION

An evaluation of the revenues that UC would pay if they were treated similar to other large non-profits in the City of Berkeley was largely conducted based on input from City staff. As shown in **Table 35**, the revenues paid by non-profits include the street lighting, clean water, business license, transient occupancy tax, and parking lot taxes. Applying

the tax rates to the existing UC and the new LRDP would result in annual revenue payments in \$6.5 million at the current time and \$7.7 million by the buildout of the LRDP.

Table 35
Lost Revenue Estimate (Large Non-Profit Status)
UC Berkeley Fiscal Impact Analysis

Public Service Category	Funding Mechanism	Amount/Rate		Unit	Annual UC Contribution Forgone		
		Residential	Institutional		Current	Net New	Total (2020)
<u>Voter- Approved Assessments and Special Taxes</u>							
Street Lighting	Assessment	\$0.0108	\$0.0108	BSF	\$158,564	\$30,010	\$188,574
Clean Storm (1)	Assessment	\$0.06	\$0.06	LSF	\$470,448	\$0	\$470,448
Business License Tax (2)	Tax	\$0.33	\$0.33	BSF	<u>\$4,845,019</u>	<u>\$916,970</u>	<u>\$5,761,988</u>
Subtotal					\$5,474,031	\$946,980	\$6,421,010
<u>Other Taxes</u>							
Transient Occupancy Tax	City Tax		12.0%	Room	\$62,698	\$0	\$62,698
Parking Lot Tax	City Tax		10.0%	Space	<u>\$932,753</u>	<u>\$282,281</u>	<u>\$1,215,034</u>
Subtotal					\$995,451	\$282,281	\$1,277,732
Total					\$6,469,482	\$1,229,261	\$7,698,742

(1) Clean Storm: UC indicates the main campus has 180 acres
(provided by City staff) 1 Acre = 43,560 square feet
180 * 43,560 = Lot square feet of 7,840,800

(2) B/L Tax on Large Non-Profits: BSF - 120,000 * current rate of \$0.33
(provided by City staff) Rate authorized up to \$0.51 per BSF

Sources: City of Berkeley; EPS

How additional is the Clean Development Mechanism?

Analysis of the application of current tools and proposed alternatives

Berlin,
March 2016

Study prepared for DG CLIMA
Reference: CLIMA.B.3/SERI2013/0026r

Authors

Dr. Martin Cames (Öko-Institut)
Dr. Ralph O. Harthan (Öko-Institut)
Dr. Jürg Füssler (INFRAS)
Michael Lazarus (SEI)
Carrie M. Lee (SEI)
Pete Erickson (SEI)
Randall Spalding-Fecher (Carbon Limits)

Head Office Freiburg

P.O. Box 17 71
79017 Freiburg

Street address

Merzhauser Straße 173
79100 Freiburg
Tel. +49 761 45295-0

Office Berlin

Schicklerstraße 5-7
10179 Berlin
Tel. +49 30 405085-0

Office Darmstadt

Rheinstraße 95
64295 Darmstadt
Tel. +49 6151 8191-0

info@oeko.de
www.oeko.de

INFRAS

Binzstrasse 23
8045 Zürich, Switzerland
Tel.: +41 44 205 95 95

Stockholm Environment Institute (SEI)

1402 Third Avenue, Suite 900
Seattle, WA 98101, USA
Tel.: +1 206 547-4000

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Abbreviations

CAR	Climate Action Reserve
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CFL	Compact Fluorescent Lamp
CO₂	Carbon Dioxide
CORSIA	Carbon Offset and Reduction Scheme for International Aviation
CP	Crediting Period
CPA	Component Project Activity of a PoA
DOE	Designated Operational Entity
EB	Executive Board of the CDM
ETS	Emissions Trading Scheme/System
f_{NRB}	Fraction of non-renewable biomass
GHG	Greenhouse Gas
GS	Gold Standard
JCM	Joint Crediting Mechanism
LED	Light Emitting Diode
MP	Methodologies Panel under the CDM EB
MRV	Monitoring, Reporting & Verification
NDC	Nationally Determined Contribution
NRB	Non-renewable Biomass
OECD	Organisation for Economic Co-operation and Development
PDD	Project Design Document
PMR	Partnership for Market Readiness (Initiative of the World Bank)
PoA	Programme of Activities
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VCS	Verified Carbon Standard

Executive summary

With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the Clean Development Mechanism (CDM) as a mechanism of the Kyoto Protocol will end. However, in terms of its standards, procedures and institutional arrangements, the CDM certainly forms an important basis for the elaboration and design of future international crediting mechanisms.

While this study provides important insights to **improve the CDM up to 2020**, the approach taken in this study could **also be applied more generally both to assess the environmental integrity of other compliance offset mechanisms**, as well as to avoid flaws in the design of new mechanisms being used or established for compliance. Many of the shortcomings identified in this study are inherent to crediting mechanisms in general, not least the considerable uncertainty involved in the assessment of additionality and the information asymmetry between project developers and regulators.

A fundamental feature of both the CDM and the mechanism under Article 6.4 is that they aim to achieve environmental integrity by ensuring that only real, measurable and additional emission reductions are generated. This study analyzes the opportunities and limits of the current CDM framework for ensuring environmental integrity, i.e. that projects are additional and that emission reductions are not overestimated. It looks at the way in which the CDM framework has evolved over time, assesses the likelihood that emission reductions credited under the CDM ensure environmental integrity and provides findings on the overall and project-type-specific environmental integrity of the CDM. In addition, it provides lessons learned and recommendations for improving additionality assessment that can be applied to crediting mechanisms generally, including to mechanisms to be used for compliance under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), and to mechanisms to be implemented under Article 6 of the Paris Agreement.

To ensure robust judgements, we have systematically analyzed the determination of additionality, the determination of baseline emissions and other issues that are key for environmental integrity. Towards this goal, we have evaluated those general CDM rules that are particularly relevant for environmental integrity and assessed in the case of specific project types the likelihood that they deliver real, measurable and additional emission reductions. Based on our analysis **key findings** include the following:

- Most **energy-related project types** (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are **unlikely to be additional**, irrespective of whether they involve the increase of renewable energy, energy efficiency improvements or fossil fuel switch.
- **Industrial gas projects** (HFC-23, adipic acid, nitric acid) are **likely to be additional** as long as the mitigation is not otherwise promoted or mandated through policies.
- **Methane projects** (landfill gas, coal mine methane) have a **high likelihood of being additional**.
- **Biomass power projects** have a **medium likelihood of being additional** overall because the assessment of additionality very much depends on the local conditions of individual projects.
- The additionality of the current pipeline of **efficient lighting projects** using small-scale methodologies is **highly unlikely** because in many host countries the move away from incandescent bulbs is well underway.

- In the case of **cook stove projects**, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. Cook stove projects are also likely to considerably **over-estimate the emission reductions** due to a number of unrealistic assumptions and default values.

Overall, our results suggest that 85% of the projects covered in this analysis and 73% of the potential 2013-2020 Certified Emissions Reduction (CER) supply have a low likelihood that emission reductions are additional and are not over-estimated. Only 2% of the projects and 7% of potential CER supply have a high likelihood of ensuring that emission reductions are additional and are not over-estimated.

Our analysis suggests that the **CDM still has fundamental flaws in terms of overall environmental integrity**. It is likely that the large majority of the projects registered and CERs issued under the CDM are not providing real, measurable and additional emission reductions.

When considering the Paris Framework, the most important change from the Kyoto architecture is that all countries have made mitigation pledges in the form of Nationally Determined Contributions (NDC). An important implication is that host countries with ambitious and economy-wide mitigation pledges have **incentives to limit international transfers of credits** to activities with a **high likelihood of delivering additional emission reductions**, so that transferred credits do not compromise the host country's ability to reach their own mitigation targets. A second important implication is that countries should **only transfer emission reductions where this is consistent with their NDC**, implying that baselines may have to be determined in relation to the host country's mitigation pledges rather than using a 'counterfactual' business as usual scenario as a default.

Taking into account this context and the findings of our analysis, we recommend that the role of crediting in future climate policy should be revisited:

- We recommend potential buyers of CERs to limit any **purchase of CERs** to either **existing projects which risk discontinuing GHG abatement** when the incentive from the CDM ceases, such as landfill gas flaring or to new **projects among** the few project types identified that **have a high likelihood of ensuring environmental integrity**.
- Buyers should **accompany purchase of CERs with support for a transition of host countries to broader and more effective climate policies**. In the short-term, where offsetting is used, it should only be on the basis that purchase of CERs does not undermine the ability of host countries to achieve their mitigation pledges.
- Given the inherent shortcomings of crediting mechanisms, we recommend focusing **climate mitigation efforts** on forms of carbon pricing **that do not rely extensively on credits** and on measures such as results-based climate finance that does not result in the transfer of credits or offsetting the purchasing country's emissions. International crediting mechanisms should play a limited role after 2020, to address specific emission sources in countries that do not have the capacity to implement alternative climate policies.
- To enhance the environmental integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend limiting such mechanisms to **project types** that have a **high likelihood of delivering additional emission reductions**. We also recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report.
- We also recommend provisions that provide strong incentives to the Parties involved to ensure the integrity of international unit transfers. This includes robust accounting provisions to **avoid double counting** of emission reductions, but could also extend to other elements, such as im-

plementation of **ambitious mitigation pledges** as a prerequisite to participating in international mechanisms.

With the adoption of the Paris Agreement, implementing more effective climate policies becomes key to bringing down emissions quickly on a pathway consistent with well below 2°C. Our findings suggest that **crediting approaches** should play a **time-limited and niche role** focusing on those project types for which additionality can be relatively assured. Crediting should serve as a stepping-stone to other, more effective policies to achieve cost-effective mitigation. Continued support to developing countries will be key. We recommend using new innovative sources of climate finance, such as revenues from auctioning of emission trading scheme allowances, rather than crediting for compliance, to support developing countries in implementing their NDCs.

Summary

Aim of the study

With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the role of the CDM as a mechanism of the Kyoto Protocol will end. However, in terms of its standards, procedures and institutional arrangements, the **CDM** certainly forms an **important basis** for the elaboration and design of future mechanisms for international carbon markets. One key feature of both the CDM and the mechanism under Article 6.4 is that they should generate **real and additional** emission reductions. In other words, emission reductions that are credited and transferred should not have occurred in the absence of the mechanism and should not be overestimated. This study analyzes the opportunities and limits of the current CDM framework and the way in which it has evolved over time and been applied to concrete projects. It provides findings on the **overall and project-type-specific environmental performance of the CDM** in the form of estimates of the **likelihood that the CDM results in real and additional emission reductions**. In addition, it provides lessons and recommendations for improving additionality assessment that can be applied to future crediting mechanisms.

Methodological approach

The main focus of this study is to assess the extent to which the CDM meets its objective to deliver “real, measurable and additional” emission reductions. In order to make well-founded judgements about the overall and project-type-specific likelihood of additionality of CDM projects, we systematically analyze CDM rules and how they have been applied to real projects in practice. We examined the rules for 1) **additionality assessment**, for 2) the **determination of baseline emissions** and 3) a number of **other issues** including the length of crediting period, leakage effects, perverse incentives, double counting, non-permanence, monitoring provisions and third party validation and verification. We approach these aspects from two different perspectives: we evaluate 1) **general CDM rules** that are particularly relevant for the delivery of real, measurable and additional emission reductions and we evaluate 2) **specific project types** with a view to assessing how likely these project types deliver additional emission reductions. To assess the impacts of our analysis, we further estimate the **potential 2013-2020 CER supply** from different project types.

Project-types-specific results

Table 1-1 (p. 13) below provides an overview of the findings on environmental integrity based on the detailed analysis of individual project types. **Most energy-related project types** (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are **unlikely to be additional**, irrespective of whether they involve the increase of renewable energy, efficiency improvements or

fossil fuel switch. An important reason why these projects types are unlikely to be additional is that the revenue from the CDM for these project types is small compared to the investment costs and other cost or revenue streams, even if the CER prices would be much higher than today. Moreover, many projects are economically attractive, partially due to cost savings from project implementation (e.g. fossil fuel switch, waste heat recovery) or domestic support schemes (renewable power generation).

Table 1-1: How additional is the CDM?

	CDM projects			Potential CER supply 2013 to 2020		
	Low	Medium	High	Low	Medium	High
	... likelihood of emission reductions being real, measurable, additional					
	No. of projects			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production						
Version <6		5			191	
Version >5			14			184
Adipic acid		4			257	
Nitric acid			97			175
Wind power	2.362			1.397		
Hydro power	2.010			1.669		
Biomass power		342			162	
Landfill gas		284			163	
Coal mine methane		83			170	
Waste heat recovery	277			222		
Fossil fuel switch	96			232		
Cook stoves	38			2		
Efficient lighting						
AMS II.C, AMS II.J	43			4		
AM0046, AM0113			0			0
Total	4.826	718	111	3.527	943	359

Sources: Authors' own calculations

Industrial gas projects (HFC-23, adipic acid, nitric acid) can generally be considered **likely to be additional** as long as they are not promoted or mandated through policies. They use end-of-pipe-technology to abate emissions and do not generate significant revenues other than CERs. HFC-23 and adipic acid projects triggered strong criticism because of their relatively low abatement costs, which provided perverse incentives and generated huge profits for plant operators. In the case of HFC-23 and nitric acid projects, perverse incentives have been adequately addressed. With regard to **adipic acid** projects, the risks for **carbon leakage have not yet been addressed**.

Methane projects (landfill gas, coal mine methane) also have a **high likelihood of being additional**. This is mainly because carbon revenues have, due to the GWP of methane, a relatively large impact on the profitability of these project types. However, both project types face **issues with regard to baseline emissions and perverse incentives** and may thus lead to over-crediting.

Biomass power projects have a **medium likelihood of being additional** since their additionality very much depends on the local conditions of individual projects. In some cases, biomass power can already be competitive with fossil generation while in other cases domestic support schemes provide incentives for increased use of biomass in electricity generation. However, where these conditions are not prevalent, projects **can be additional**, particularly if CER revenues for **methane avoidance can be claimed**. Biomass projects also face other issues, in particular with regard to demonstrating that the **biomass used is renewable**.

The additionality of **efficient lighting** projects using small-scale methodologies is **highly problematic** because there were large PoAs in countries in which the move away from incandescent bulbs was well underway. The **new methodologies** address these problems but they are **not mandatory** and the small-scale methodologies are, while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes.

For **cook stove** projects, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. Particularly in urban areas, the additionality of these project types is questionable. Cook stove projects are also likely to considerably over-estimate the emission reductions due to a number of unrealistic assumptions and default values.

Overall environmental assessment

Based on these considerations, we estimate that **85% of the covered projects and 73% of the potential 2013-2020 CER supply have a low likelihood** of ensuring environmental integrity (i.e. ensuring that emission reductions are additional and not over-estimated). Only **2% of the projects and 7% of potential CER supply have a high likelihood** of ensuring environmental integrity. The remainder, 13% of the projects and 20% of the potential CER supply, involve a medium likelihood of ensuring environmental integrity (Table 1-1, p. 13).

Compared to earlier assessments of the environmental integrity of the CDM, our analysis suggests that the CDM's **performance as a whole has anything but improved**, despite improvements of a number of CDM standards. The main reason for this is a **shift in the project portfolio towards projects with more questionable additionality**. In 2007, CERs from projects that do not have revenues other than CERs made up about two third of the project portfolio, whereas the 2013-2020 CER supply potential of these project types is only less than a quarter. A second reason is that the **CDM Executive Board (EB)** has not only improved rules but also **made simplifications** that undermined the integrity. For example, positive lists have been introduced for many technologies, for some of which the additionality is questionable and some of which are promoted or required by policies and regulations in some regions (e.g. efficient lighting). A third reason is that the **CDM EB** did not take effective means to **exclude project types** with a low likelihood of additionality. While positive lists have been introduced, project types with more questionable additionality have not been excluded from the CDM. Standardized baselines provide a further avenue to demonstrating additionality but do not reduce the number of projects wrongly claiming additionality. The improvements to the CDM mainly aimed at **simplifying requirements and reducing the number of false negatives** but did not address the false positives.

The result of our analysis therefore suggests that the **CDM has still fundamental flaws in terms of environmental integrity**. It is likely that the large majority of the projects registered and CER issued under the CDM are not providing real, measureable and additional emission reductions. Therefore, the experiences gathered so far with the CDM should be used to improve both the CDM rules for the remaining years and to avoid flaws in the design of new market mechanisms being established under the UNFCCC.

Recommendations for improving general additionality rules

For an additionality test to function effectively, it must be able to assess, with high confidence, whether the CDM was the deciding factor for the project investment. However, additionality tests can never fully avoid wrong conclusions. **Information asymmetry** between project developers and regulators, combined with the economic incentives for project developers to have their project recognised as additional, are a major challenge. We carefully scrutinised the **four main approaches** used to determine additionality. Our analysis shows that **prior consideration** is a necessary and important but not sufficient step for ensuring additionality of CDM projects and that this step largely

works as intended. The subjective nature of the **investment analysis** limits its ability to assess with high confidence whether a project is additional. Especially for project types in which the financial impact of CERs is relatively small compared to variations in other parameters, such as large power projects, doubts remain as to whether investment analysis can provide a strong 'signal to noise' ratio. The **barrier analysis** has lost importance as a stand-alone approach of demonstrating additionality. Non-monetized barriers remain subjective and are often difficult to verify by the DOEs. In general, the **common practice analysis** can be considered a more objective approach than the barriers or investment analysis due to the fact that information on the sector as a whole is considered rather than specific information of a project only. However, the way in which common practice is currently assessed needs to be substantially reformed to provide a reasonable means of demonstrating additionality; it is important to reflect that market penetration is not for all project types a good proxy for the likelihood of additionality.

Against this background, we recommend that the **common practice analysis** is given a **more prominent role in additionality determination** though only after a significant reform:

- The 'one-size-fits-all' approach of determining common practice should be replaced by **sector- or project-type-specific guidance**, particularly with regard to distinguishing between different and similar technologies and with regard to the threshold for market penetration.
- The **technological potential** of a certain technology should also be taken into account in order to avoid that a project is deemed additional although the technological potential is already largely exploited in the respective country.
- The common practice analysis should at least cover the **entire country**. However, if the absolute number of activities in the host country does not ensure statistical confidence, the scope needs to be extended to other countries.
- As a default, all CDM projects should be included in the common practice analysis, unless a methodology includes different requirements.

We further recommend that the **investment analysis** is excluded as an approach for demonstrating additionality for projects types in which the 'signal to noise' ratio is insufficient to determine additionality with the required confidence. For those project types in which the investment analysis would still be eligible, the project participant must confirm the all information is true and accurate and that the investment analysis is consistent with the one presented to debt or equity funders. The **barrier analysis** should be abolished entirely as a separate approach in the determination of additionality at project level (though it may be used for determining additionality of project types). Barriers that can be monetized should be addressed in the investment analysis while all other barriers should be addressed in the context of the reformed common practice analysis.

In addition, we recommend improvements to key general CDM rules:

- **Renewal and length of crediting periods:** At the renewal of the crediting period the validity of the baseline scenario should be assessed for CDM project types for which the baseline is the 'continuation of the current practice' or if changes such as retrofits could also be implemented in the baseline scenario at a later stage. Crediting periods of project types or sectors that are highly dynamic or complex should be limited to one single crediting period. Moreover, generally abolishing the renewal of crediting periods while allowing a somewhat longer single crediting period for project types that require a continuous stream of CER revenues to continue operation may be considered.
- **Positive Lists:** The review of validity should also be extended to project types covered by the microscale additionality tool. In addition, positive lists must address the impact of na-

tional policies and measures to support low emission technologies (so-called E- policies). To maintain environmental integrity of the CDM overall, positive lists should be accompanied by negative lists.

- **Standardized baselines:** Once established in a country, their use should be made mandatory and all CDM facilities should be included in the peer group used for the establishment of standardized baselines.
- **Consideration of domestic policies (E+/E-):** The risk of undermining environmental integrity by over-crediting emission reductions is likely to be larger than the creation of perverse incentives for not establishing E- policies. Therefore, adopted policies and regulations reducing GHG emissions (E-) should be included when setting or reviewing crediting baselines while policies that increase GHG emissions (E+) should be discouraged by being excluded from the crediting baseline where possible.
- **Suppressed demand:** An expert process should be established to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand could be restricted to countries where development needs are highest and the potential for over-crediting is the smallest.

Recommendations to improve project type specific rules

Industrial gas projects: Adipic acid production is a highly globalised industry and all plants are very similar in structure and technology. Therefore, a global benchmark of 30 kg/t applied to all plants would prevent carbon leakage, considerably reduce rents for plant operators, and allow the methodology to be simplified by eliminating the calculation of the N₂O formation rate. After issues related to perverse incentives have been successfully addressed through ambitious benchmarks, **HFC-23** and **nitric acid** projects would provide for a high degree of environmental integrity. However, industrial gas projects provide for low-cost mitigation options. These emission sources could therefore also be addressed through domestic policies, such as regulations, or by including the emission sources in domestic or regional ETS, and help countries achieve their Nationally Determined Contributions (NDCs) under the Paris Agreement. Parties to the Montreal Protocol are also considering regulating HFC emissions. We therefore recommend that HFC-23 projects are not eligible under the CDM.

Energy-related project types: We recommend that these project types should, in principle, no longer be eligible under the CDM. However, in least developed countries, some project types, particularly wind and small-scale hydropower plants, may still face considerable technological and/or cost barriers. These project types may thus remain **eligible in least developed countries**. In cases in which **biomass power generation** is not competitive with fossil generation technologies, CER revenues can have a significant impact on the profitability of a project, particularly if credits for methane avoidance are claimed as well. We therefore recommend that only biomass power projects avoiding methane emissions remain eligible under the CDM, provided that the corresponding provisions in the applicable methodologies are revised appropriately.

With regard to **demand-side energy efficiency** project types with distributed sources – **cook stoves** and **efficient lighting** – we have identified concerns which question their overall environmental integrity. However, if cook stove methodologies were revised considerably, including more appropriate values for the fraction of non-renewable biomass and if approaches for determining the penetration rate of efficient lighting technologies were made mandatory for all new projects and CPAs while the older methodologies are withdrawn, we recommend that these project types should remain eligible.

Methane projects: Landfill gas and coal mine methane projects are likely to be additional. However, there are concerns in terms of over-crediting, which should be addressed through improvements of the respective methodologies, particularly by introducing region-specific soil oxidations factors and requesting DOEs to verify that landfilling practices are not changed. With regard to landfill gas, we recommend that this project type only be eligible in countries that have policies in place to transition to more sustainable waste management practices.

Implication for the future use of international carbon markets

The **CDM has provided many benefits**. It has brought innovative technologies and financial transfers to developing countries, helped identify untapped mitigation opportunities, contributed to technology transfer, may have facilitated leapfrogging the establishment of extensive fossil energy infrastructures and created knowledge, institutions, and infrastructure that can facilitate further action on climate change. Some projects provided significant sustainable development co-benefits. Despite these benefits, after well over a decade of gathering considerable experience, the **enduring limitations** of GHG crediting mechanisms are apparent.

Firstly and most notably, the **elusiveness of additionality** for all but a limited set of project types is very difficult, if not impossible, to address. Information asymmetry between project participants and regulators remains a considerable challenge. This challenge is **difficult to address through improvements of rules**. Secondly, international crediting mechanisms involve an **inherent and unsolvable dilemma**: either they might create **perverse incentives for policy makers** in host countries not to implement policies or regulations to address GHG emissions – since this would reduce the potential for international crediting – or they **credit activities that are not additional** because they are implemented due to policies or regulations. Thirdly, for many project types, the **uncertainty of emission reductions** is considerable. Our analysis shows that risks for over-crediting or perverse incentives for project owners to inflate emission reductions have only partially been addressed. It is also highly uncertain for how long projects will reduce emissions, as they might anyhow be implemented at a later stage without incentives from a crediting mechanism – an issue that is not addressed at all under current CDM rules. A further overarching shortcoming of crediting mechanisms is that they do **not make all polluters pay but rather they make them subsidize the reduction of emissions**. Most of these shortcomings are inherent to using crediting mechanisms, which **questions the effectiveness of international crediting mechanisms as a key policy tool** for climate mitigation.

The future role of crediting mechanisms should therefore be revisited in the light of the Paris Agreement. Several **elements of the CDM could be used** when implementing the mechanism established under Article 6.4 of the Paris Agreement or when implementing (bilateral) crediting mechanisms under Article 6.2. However, the context for using crediting mechanisms has fundamentally changed. The most important change to the Kyoto architecture is that all countries have to submit NDCs that include mitigation pledges or actions. The Paris Agreement therefore requires countries to **adjust their reported GHG emissions** for international transfers of mitigation outcomes, in order to **avoid double counting** of emission reductions. This implies that the baseline, and therefore additionality, may be determined in relation to the mitigation pledges rather than using a 'counterfactual' scenario as under the CDM, and that countries could only transfer emission reductions that were beyond what they had pledged under their NDC. A second important implication relates to the incentives for host countries to ensure integrity. Host countries with ambitious and economy-wide mitigation pledges would have incentives to ensure that international transfers of credits are limited to activities with a high likelihood of delivering additional emission reductions. However, our analysis showed that only a few project types in the current CDM project portfolio have a high likelihood of providing additional emission reductions, whereas the environmental integrity is questionable and uncertain for most project types. In combination, this suggests that the

future supply of credits may mainly come either from emission sources not covered by mitigation pledges or from countries with weak mitigation pledges. In both cases, host countries would not have incentives to ensure integrity and credits lacking environmental integrity could increase global GHG emissions.

At the same time, demand for international credits is also uncertain. Only a few countries have indicated that they intend to use international credits to achieve their mitigation pledges. An important source of demand could come from the market-based approach pursued under the International Civil Aviation Organization (ICAO), and possibly from an approach pursued under the International Maritime Organization (IMO). For these demand sources, avoiding double counting with emission reductions under NDCs will be a challenge that is similar to that of avoiding double counting between countries. A number of institutions are exploring the use of crediting mechanisms as a vehicle to disburse results-based climate finance without actually transferring any emission reduction units. This way of using crediting mechanisms could be more attractive to developing countries; they would not need to add exported credits to their reported GHG emissions, as long as the credits are not used by donors towards achieving mitigation pledges. The implications of non-additional credits are also different: they would not directly affect global GHG emissions, but could lead to a less effective use of climate finance. However, donors of climate finance aim to ensure that their funds be used for actions that would not go ahead without their support. Given the considerable shortcomings with the approaches for assessing additionality, we recommend that donors should not rely on current CDM rules in assessing the additionality of projects considered for funding.

Taking into account this context and the findings of our analysis, we recommend that the role of crediting in future climate policy should be revisited:

- We recommend potential buyers of CERs to limit any **purchase of CERs** to either existing **projects that are at risk of stopping GHG abatement** or the few project types that have a **high likelihood of ensuring environmental integrity**. Continued purchase of CERs should be accompanied with a plan and support to host countries to **transition to broader and more effective climate policies**. We further recommend to pursue the purchase and cancellation of CERs as a form of **results-based climate finance** rather than using CERs for compliance towards meeting mitigation targets.
- Given the inherent shortcomings of crediting mechanisms, we recommend **focusing climate mitigation efforts on** forms of carbon pricing that do **not rely extensively on credits**, and on measures such as results-based climate finance that do not necessarily serve to offset other emissions. International crediting mechanisms should play a limited role after 2020, to address specific emission sources in countries that do not have the capacity to implement broader climate policies.
- To enhance the integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend **limiting** such mechanisms to **project types** that have a **high likelihood of delivering additional emission reductions**. We recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report. We further recommend revisiting the current approaches for additionality, with a view to abandoning subjective approaches and adopting more standardized approaches. We also recommend curtailing the length of the crediting periods with no renewal.
- Given the high integrity risks of crediting mechanisms, we recommend provisions that provide strong incentives to the Parties involved to ensure integrity of international unit transfers. This includes robust accounting provisions to **avoid double counting** of emission re-

ductions, but could also extend to other elements, such as **ambitious mitigation pledges** as a prerequisite to participating in international mechanisms.

In conclusion, we believe that the CDM has had a very important role to play, in particular in countries that were not yet in a position to implement domestic climate policies. However, our assessment confirms, alongside other evaluations, the strong shortcomings inherent to crediting mechanisms. With the adoption of the Paris Agreement, implementing more effective climate policies becomes key to bringing down emissions quickly on a pathway consistent with well below 2°C. Our findings suggest that **crediting approaches** should play a **time-limited and niche-specific role** in which additionality can be relatively assured, and the mechanism can serve as stepping-stone to other, more effective policies to achieve cost-effective mitigation. In doing so, continued support to developing countries will be key. We recommend using new innovative sources of finance, such as revenues from auctioning of ETS allowances, rather than international crediting mechanisms, to support developing countries in implementing their NDCs.

1. Introduction

With almost 7,700 Clean Development Mechanism (CDM) projects and almost 300 programmes of activities (PoAs) registered and more than 1.6 billion Certified Emissions Reductions (CER) issued, the CDM has developed into an important component of the global carbon market. However, its role in the future remains uncertain. With the adoption of the Paris Agreement, which establishes a mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development (Article 6.4), it is clear that the role of the CDM as a mechanism of the Kyoto Protocol will end, most likely soon after 2020.

However, in terms of its standards, procedures and institutional arrangements, the CDM forms certainly an important base for the elaboration and design of future mechanisms for international carbon markets. The mechanism established under Article 6.4 of the Paris Agreement includes several provisions that are similar to the CDM. Parties also decided that the rules, modalities and procedures of the new mechanism should be adopted on the basis of the “experience gained with and lessons learned from existing mechanisms”. Moreover, experiences gained from the CDM can also be used for the development of domestic baseline and credit policies both in developed and developing countries.

One key feature of both the mechanism under the Paris Agreement (Article 6.4) and domestic baseline and credit policies is that they should generate real and additional emission reductions, in other words: the credited and transferred emission reductions should not have occurred in the absence of the mechanism and or policy. The ability to deliver such a result depends heavily on having a reasonably effective way to assess additionality both for specific project types and on an aggregate basis, and to set a baseline such that the number of credits issued does, in total, not exceed actual reductions.

Demonstrating additionality and setting baselines are the areas in which the most concerns have been raised with the CDM, in particular regarding the investment, barrier and common practice analysis and the assessment of prior consideration. Given its counterfactual nature, asymmetries of information regarding costs, financing, barriers and local project conditions, and signal-to-noise issue, it has been difficult to implement a reliable method for assessing additionality and setting baselines. Other factors that also affect the overall mitigation outcome are the length of the crediting period used, how leakage concerns are dealt with and whether any perverse incentives are addressed, among others.

The difficulties with these traditional approaches have resulted in further refinement and revision of these approaches as well as the introduction of several alternative approaches to setting of baselines and testing additionality. Examples include the use of default values, performance benchmarks or penetration rates and discounting approaches. More fundamental changes include the use of highly standardized baselines and additionality tests at the sectoral level. It remains to be seen whether the methodological difficulties with highly standardized approaches can be solved to make them operational, and whether they will result in a lower likelihood of non-additional credits being issued.

The additionality of CDM projects has been assessed in the past in several general and project-specific studies. Much of the research was conducted before the improvement of rules and the introduction of new approaches, such as standardized baselines. This study aims to assess whether and how these changes have affected the quality of CDM projects, focusing on the project portfolio available in the second commitment period of the Kyoto Protocol and taking due account of the improvements implemented over time.

In order to make well-founded judgements about the overall and project-type-specific likelihood of additionality of CDM projects, a systematic assessment is required of the CDM rules and how they have been applied to real projects in practice. A similar exercise should be carried out for the different reforms suggested to the existing rules. This study therefore analyzes the opportunities and limits of the current CDM framework and the way in which it has evolved over time and been applied to concrete projects. It provides robust and quantified conclusions on the overall and project-type-specific environmental performance of the CDM in the form of estimates of the likelihood that the CDM results in real and additional emission reductions.

2. Methodological approach

2.1. General research approach

The main focus of this study is to assess the extent to which the CDM meets its objective stipulated in Article 12.5(c) of the Kyoto Protocol to deliver “real, measurable and additional” emission reductions. Based on the findings, concrete recommendations are made for further reform of the CDM and implications for the future role of the CDM are discussed.

There are two principal challenges to evaluating of the ability of the CDM to deliver additional emission reductions: the inherent uncertainty of a counter-factual baseline and the uncertainty and bias associated with project and baseline data. Therefore, any assessment of the extent of non-additional or otherwise under- or over-credited CDM activity can therefore only provide rough and directional estimates. Project design documents (PDDs) and monitoring reports provide substantial data and assumptions. However, these data and assumptions are often limited (they may not cover all relevant activity, especially non-CDM activity) and can involve considerable judgment by parties that have an interest in the outcome (e.g. selecting among alternative projections of future fuel prices) made for the purpose of meeting CDM requirements.

We examine the three main aspects as regards whether the CDM delivers additional emission reductions:

1. **Additionality assessment:** The assessment of additionality refers to the question of whether a project was implemented due to the CDM. Additionality is the most important prerequisite to providing an emissions benefit. If a project would have been implemented in the absence of the CDM incentives, the emission reductions would have occurred anyway. If a Party uses non-additional CERs rather than reducing its own emissions to meet its emission reduction commitments, global GHG emissions would be higher than they would have otherwise been. Because errors in additionally determination affect the validity of an entire project’s CERs, additionality assessment forms the main focus of this study.
2. **Determination of baseline emissions:** A second important aspect is how the baseline emissions are determined. Determining baseline emissions is associated with considerable uncertainty. A crediting baseline that is above the emissions that would most likely occur in the absence of the project can lead to significant over-crediting. Vice versa, ambitious baselines that are below the emissions that would most likely occur in the absence of the project, can result in under-crediting.
3. **Other issues:** A number of other issues are important to deliver additional emission reductions, including:
 - the length of crediting period,
 - criteria for the renewal of the crediting period,

- approaches for determining indirect emission effects, such as leakage effects,
- the way in which perverse incentives for both project developers and policy makers are addressed,
- the extent to which double counting of emission reductions within the mechanism and with other mechanisms and pledges is avoided,
- whether potential non-permanence of emission reductions is sufficiently addressed,
- whether monitoring provisions are appropriate, and
- the effectiveness of the regulatory framework for third party validation and verification.

We also touch upon these issues, in particular when they raise concerns with regard to the integrity of the CDM. They do not, however, form the focus of this study.

In our examination, we approach these aspects from two different perspectives:

- **General CDM rules:** In Chapter 3, we evaluate approaches for determining general CDM additionality rules that are particularly relevant for the delivery of real, measurable and additional emission reductions. This includes an assessment of innovative and potentially more objective approaches for setting baselines and determining additionality and an analysis of whether and how these approaches could improve the determination of additionality under the CDM.
- **Specific project types:** In Chapter 4, we evaluate specific project types with a view to assessing how likely these project types deliver additional emission reductions. A separate evaluation by project type is important as the likelihood of additional emission reductions can differ significantly among project types. This evaluation covers the major project types contributing to a large share of the emission reductions in the CDM portfolio.

Drawing on findings from Chapters 3 and 4, we provide an overall assessment of the additionality of the CDM project portfolio in Chapter 5. In Chapter 6, we provide a summary of key recommendations for further reform of the CDM. Finally, we discuss the implications for the future use of the CDM in Chapter 7.

The study employs several analytical methodologies and approaches:

- **Literature analysis** forms the basis for our evaluation of general CDM rules, specific project types, and innovative approaches towards baseline setting and additionality assessment.
- **Qualitative assessment of relevant CDM rules** with a view to their ability for ensuring additional emission reductions. We identify potential shortcomings in the current rules and propose options for addressing them.
- **Empirical, quantitative evaluation of how the CDM rules are applied** through analysis of a representative random sample of projects. The analysis will be based on information in PDDs and validation reports and, where necessary, also monitoring and verification reports. The projects will be identified through stratified random sampling, aiming to ensure representativeness of host countries and project types. This empirical analysis aims to identify possible shortcomings in the application of general CDM rules. The information and data to be evaluated is specific for each of the identified general CDM rules and the questions identified. The methodological approach of the empirical evaluation is further specified in Section 2.2 below.
- **Economic assessment** of the feasibility of different project types is another important building block of the study. The economic assessment is conducted for the evaluation of

specific project types in Chapter 4. The methodological approach of the empirical evaluation is further specified in Section 2.3 below.

- **Sectoral analysis** of the market situation for specific project types to assess whether the technology has often already been implemented without the CDM and whether an observed market uptake occurs due to the CDM. The sectoral analysis is conducted for the evaluation of specific project types in Chapter 4. The methodological approaches are further specified in the corresponding sections.

We use the CDM rules and the CDM project portfolio as of 1 January 2014 as the basis for the assessment.

To assess the impacts of our analysis, we further estimate the potential 2013-2020 CER supply for different project types. The method used to estimate the potential CER volume is described in Section 2.3.

2.2. Empirical evaluation of CDM projects

The assessment of key CDM rules for additionality demonstration in Chapter 3 is based on an in-depth evaluation of PDDs, validation reports, etc. of randomly selected CDM projects. The project samples were randomly drawn from the so-called CDM project pipeline as of 1 January 2014 (UNEP DTU 2014). This pipeline is a compilation of certain information and data provided in the project design document (PDD) of each CDM project. For this assessment, only registered CDM projects were taken into account as the PDDs usually undergo significant changes during the validation period. To ensure representativeness, the samples were stratified by the following characteristics and strata:

- Location (host country/region)
 - China
 - India
 - Asia & Pacific
 - Brazil
 - Latin America
 - Rest of the World
- Technology
 - Industry (HFC-23, N₂O, cement, energy efficiency, energy distribution, etc.)
 - Electricity generation from hydro
 - Electricity generation from wind
 - Electricity generation from renewable energy (solar, tidal, etc.)
 - Other renewable energy (biomass, geothermal, mixed renewable energy, etc.)
 - Waste sector (landfill gas, methane avoidance, etc.)
 - Other (afforestation, reforestation, agriculture, transport, etc.)
- Scale
 - Large-scale projects
 - Small-scale projects
- Time (registration year)
 - Pre 2010
 - In 2010 or 2011
 - Post 2011.

The in-depth assessment of project samples was conducted for the key additionality determination rules: investment analysis (Section 3.2), barrier analysis (Section 3.3) and common practice analy-

sis (Section 3.3). For each of these rules a separate sample of 30 randomly selected CDM projects was drawn.

Since the CDM project pipeline did not include information about which option of additionality determination was applied in the PDD, we had to conduct a two-step sampling: In the first step, we drew a representative sample of 300 projects. For each of the projects of this sample we identified which additionality determination rules were applied so that we could use this sample as population for the second sampling step in which we drew the samples for each of the additionality determination rules.¹

2.3. Estimation of the potential CER supply

We estimate the potential CER supply² for the purpose of assessing the overall integrity of the CDM based on our findings for specific project types or specific additionality tests. The potential CER supply is estimated mainly on the basis of the CDM pipeline as of 1 January 2014 (UNEP DTU 2014). Moreover, we included additional information from a similar pipeline which is provided by IGES (2014). All CDM projects which were registered by 1 January 2014 are taken into account (7,418). In the case of industrial gas projects (HFC-23, adipic acid, nitric acid), some baseline and monitoring methodologies were significantly revised, which has a major impact on the potential CER supply in the second and third crediting periods. For these projects, we use specific bottom-up estimates derived from project-specific information (Schneider & Cames 2014).

We distinguish the CER supply potential considering the duration of the commitment periods under the Kyoto Protocol:

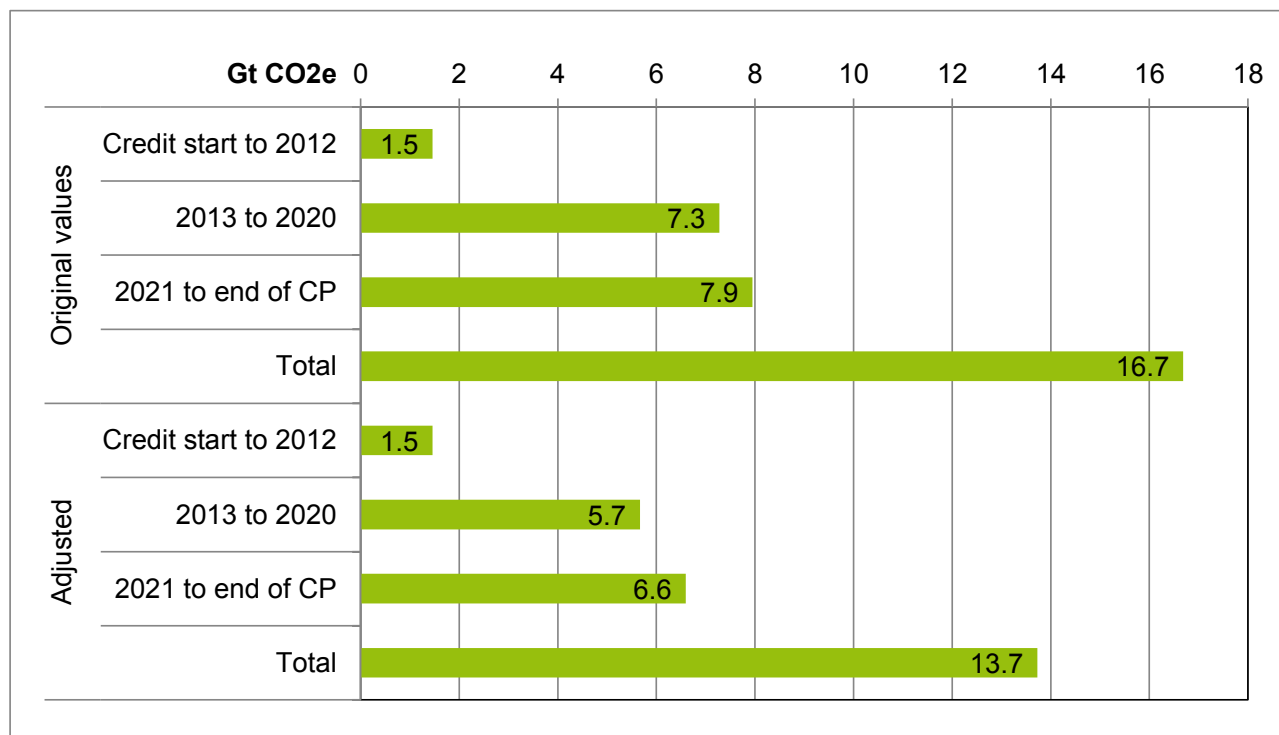
- from credit start to the end of 2012,
- from the beginning of 2013 to the end of 2020 and
- from the beginning of 2021 to the end of the crediting periods (CP).

Our study is focused on the period of 2013 to 2020.

Figures for the period from credit start to the end of 2012 reflect the actual CER issuance rather than the potential supply (UNFCCC 2015a). For the latter two periods, we take into account the issuance success rate provided in the CDM pipeline and adjust the expected CER supply accordingly. For some projects, more CERs were issued than projected while for most of the CDM projects less CERs were issued. Several projects had not issued any CERs (4,913). For those projects we assume either the average issuance rate for the respective project type or – if no CERs have been issued for that project type so far – the overall average of the issuance success rate. Figure 2-1 provides an overview of the potential CER supply.

¹ A more detailed description of the sampling approach, the code used for drawing the samples and the reference numbers of the projects drawn into each of the samples can be found in Section 8.1 of the Annex.

² The actual CER supply depends on various conditions of the global carbon market and particularly on price expectations. However, also under normal market conditions, price forecasts are very uncertain. Under post-2012 market conditions, prices are even more uncertain. We therefore only estimate the potential CER supply which is derived from information in PDDs and other project specific or general documents but ignore any interaction with the global carbon market. At price levels of less than \$1/CER, the estimated volumes will not be achieved in practice.

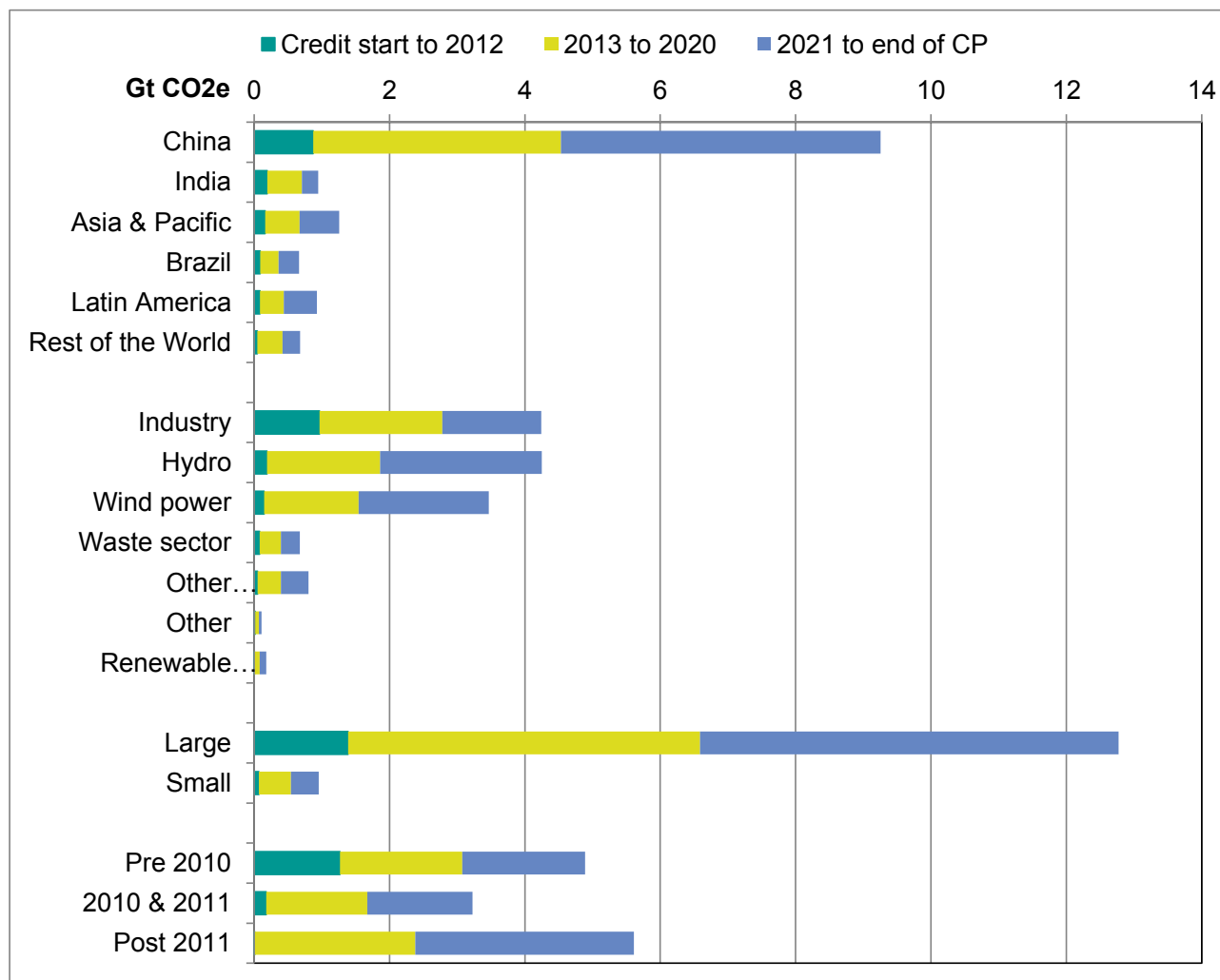
Figure 2-1: Potential CER supply, original and adjusted values

Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

The average adjustment factor is -22% though it ranges from -4% for N₂O projects to some -67% for transport projects. The adjusted CER supply for the period of 2013 to 2020 amounts to almost 5.7 billion CERs, almost 4 times the volume issued for the first crediting period.

Figure 2-2 illustrates where the potential CER supply stems from. Obviously China was and will remain the largest potential supplier of CERs. Almost two thirds (64.5%) of the potential CER supply in 2013 to 2020 are expected to be provided by Chinese CDM projects. In terms of project types, the large majority of supply stems from industry (32.0%), hydro (29.4%) and wind (24.6%) projects. Not surprisingly, the large majority (91.3%) of CERs stems from large scale projects while the breakdown in terms of registration period is more even: 31.8% stems from projects registered before 2010, 26.3% from projects registered in 2010 and 2011 while 41.8% of the potential CER supply in the period of 2013 to 2020 can be generated from CDM projects registered after 2011.

Figure 2-2: Potential CER supply by stratification categories



Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

In Chapter 4 we analyze the extent to which the likelihood of projects and CERs being additional depends on the project type. We look at 12 different project types, which together cover a broad range of activities and technologies. In terms of CER supply, these 12 project types amount to 85% of the potential supply in the period of 2013 to 2020 (Table 2-1). The largest supply potential is provided by hydro and wind power projects (29.4% and 24.6%, respectively). Industrial gas projects amount to almost 15% of the supply potential while biomass power, landfill gas, waste heat recovery and fossil fuel switch projects could each generate some 3-4% of the supply potential. Compared to these projects types the supply potential of cook stoves (0.04%) and efficient lighting (0.07%) are almost negligible. However, since these project types are often included in government purchase programs or voluntary offset schemes and since their share among projects registered after 2012 is significant, we consider it worthwhile to examine these two project types in greater depth and to assess their likelihood of being additional and of generating additional CERs.

Table 2-1: Potential CER supply by project type

	No. of projects	Credit start to 2012	2013 to 2020	2021 to end of CP Adjusted	Total
			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production	19	507	375	547	1,429
Adipic acid	4	201	257	269	727
Nitric acid	97	57	175	172	404
Hydro power	2,010	191	1,669	2,388	4,249
Wind power	2,362	148	1,397	1,929	3,475
Biomass power	342	25	162	169	355
Landfill gas	284	57	163	159	380
Coal mine methane	83	34	170	123	327
Waste heat recovery	277	63	222	62	346
Fossil fuel switch	96	51	232	175	458
Cook stoves	38	0.1	2.3	0.4	2.7
Efficient lighting	43	0.4	3.8	0.2	4.5
Not covered	1,763	124	842	603	1,569
Total	7,418	1,459	5,671	6,596	13,726

Sources: UNEP DTU 2014, IGES 2014, UNFCCC 2015a, Schneider & Cames 2014, authors' own calculations

The first Programme of Activities (PoA) was registered in July 2009. From then until the end of 2013, 243 PoAs were registered in total, the large majority of them in 2012 (193). While cook stoves and efficient lighting account for only a small share in the CDM project pipeline, they are quite relevant in the context of PoAs. By the end of 2013, they account together for a quarter of the registered PoAs. Table 2-2 provides a breakdown of the potential CER supply from PoAs by project types.

Table 2-2: Potential CER supply from PoAs

	No. of programs	Credit start to 2012	2013 to 2020	2021 to end of CP	Total
			Mt CO ₂ e		
Hydro power	26		5	13	17
Wind power	24		18	45	63
Landfill gas	4	0	12	27	40
Coal mine methane	2		5	10	15
Fossil fuel switch	2		0	0	0
Cook stoves	31	0	33	82	115
Efficient lighting	30	2	17	63	82
Not covered	124	0	70	144	214
Total	243	2	161	385	547

Sources: UNEP DTU 2014, UNFCCC 2015b, authors' own calculations

The main difference of PoAs compared to projects bundles is that PoAs can – once registered – be extended over time by an unlimited number of so-called component project activities (CPA). An estimate of the CER supply potential is thus less reliable than the estimate for the project pipeline.

However, taking into account all CPAs included in PoAs by the end of 2013, the potential CER supply can roughly be estimated, though it is obvious that the actual supply could be much higher. PoA volumes are much more difficult to estimate, because a PoA might be registered with only one CPA that has 1,000 tCO₂ per year emissions reductions but which may ultimately include CPAs that reduce hundreds of thousands of tCO₂ per year.

Noting these limitations, all PoAs could supply some 0.16 billion CERs in total in the period of 2013 to 2020. The final volume of these PoAs could be many times this amount. Almost a third (31.4%) of this supply would be provided by cook stove or efficient lighting PoAs. CERs from renewable power generation programmes amount to 14% of the supply potential of PoAs. Interestingly, almost half of the PoAs do not fall into the project type categories which together account for 85% of the potential CER supply from CDM projects. This supports the hypothesis that PoAs address project categories or technologies that cannot be adequately addressed by individual CDM projects.

2.4. Economic assessment of CER impact

The demonstration of additionality has been a key issue in the CDM since the beginning of the Kyoto mechanisms (Chapter 3). While most researchers agree that there is no simple and objective approach to determining additionality, several authors argue that the impact of CER revenues on the economic feasibility of projects is an important indicator for the likelihood for projects to be additional (for example Sutter 2003, Schneider 2007, Spalding-Fecher et al. 2012). This builds on the assumption that project proponents are more likely to implement a project due to the CDM if CER revenues have a significant impact on the economic performance of the project. While other benefits from the CDM (e.g. the public relation aspect of registering a project under the UNFCCC) may in some cases help projects to go ahead that would not be implemented in the absence of the CDM, the economic benefit of CER revenues may be considered the main driver to implement CDM projects on a larger scale.

A high economic benefit resulting from CER revenues does not guarantee additionality, because some projects may already be economically viable without CER revenues and may only become more profitable with the CDM. However, low CER revenues are an indicator of a lower likelihood that the project is additional, because with low CER revenues it also becomes more likely that the project would be implemented in the absence of the CER revenues.

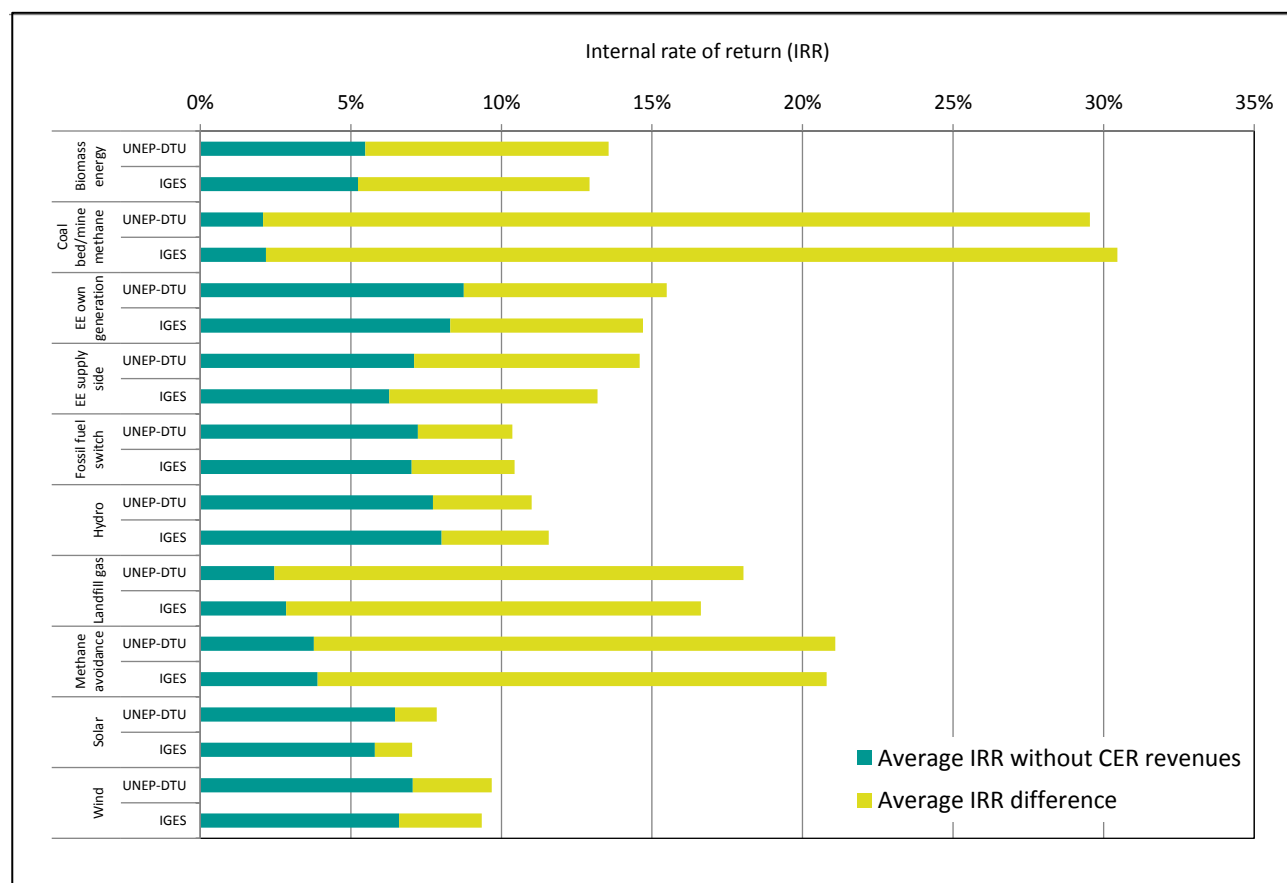
In 2005, the CDM Executive Board (EB) decided that, in order to be additional, projects have to demonstrate that they are economically unattractive; however, they are not required to demonstrate that with CER revenues they would become economically viable. Schneider (2007) highlighted that this leads to the situation in which projects with very low CER revenues can prove additionality even though the CER revenues contribute only marginally to closing the profitability gap.

It is difficult to define a minimum required level of contribution from CER revenues that is needed to trigger an investment decision. An important concept in this context is the *signal-to-noise ratio* issue for investment analysis, as mentioned by, for example, Spalding-Fecher et al. (2012): The generally high variability and uncertainty of key parameters that determine the profitability of a mitigation project is often considerably higher than the expected economic benefit of CERs. If the economic impact of the CERs is lower than key uncertainties in the investment analysis, it is rather unlikely that the registration under the CER was the conclusive trigger for the investment and, hence, it is likely that the project is non-additional.

Table 2-3: Impact of CER revenues on the profitability of different project types

Type	Source	Projects with available IRR information	Average IRR without CER revenues	Average IRR with CER revenues	Average IRR difference
Biomass energy	UNEP-DTU	271	5.5%	13.6%	8.1%
	IGES	216	5.2%	12.9%	7.7%
Coal bed/mine methane	UNEP-DTU	70	2.1%	29.5%	27.5%
	IGES	75	2.2%	30.5%	28.3%
EE own generation	UNEP-DTU	205	8.8%	15.5%	6.7%
	IGES	202	8.3%	14.7%	6.4%
EE supply side	UNEP-DTU	36	7.1%	14.6%	7.5%
	IGES	23	6.3%	13.2%	6.9%
Fossil fuel switch	UNEP-DTU	47	7.2%	10.4%	3.1%
	IGES	39	7.0%	10.4%	3.4%
Hydro	UNEP-DTU	1,753	7.7%	11.0%	3.3%
	IGES	1,635	8.0%	11.6%	3.6%
Landfill gas	UNEP-DTU	183	2.5%	18.0%	15.6%
	IGES	165	2.8%	16.6%	13.8%
Methane avoidance	UNEP-DTU	203	3.8%	21.1%	17.3%
	IGES	204	3.9%	20.8%	16.9%
Solar	UNEP-DTU	154	6.5%	7.9%	1.4%
	IGES	122	5.8%	7.0%	1.2%
Wind	UNEP-DTU	2,162	7.1%	9.7%	2.6%
	IGES	1,804	6.6%	9.4%	2.8%

Sources: UNEP DTU 2014, IGES 2014, authors' own calculations

Figure 2-3: Impact of CER revenues on the profitability of different project types


Sources: UNEP DTU 2014, IGES 2014, authors' own calculations

Information on the impact of CER revenues on economic profitability is available from different sources. Table 2-3 and Figure 2-3 show the impact based on data included in project design documents and as documented in the databases by UNEP DTU (2014) and IGES (2014). In addition, Lütken (2012) has analyzed the annual CER revenues in relation to the capital investment and observed for some project types a (very) limited impact stemming from CER revenues. Spalding-Fecher et al. (2012) analyze the impact of CER revenues on the project IRR for different project types in the IGES database. They conclude that the CER impact on the project IRR is the lowest for renewables including hydro and wind (increase of IRR by 2-3%), fuel switch (4%), and supply-side efficiency (5%). They also provide an overview of more studies analysing the impact of CER revenues for different project types. The relatively low impact of CER revenues compared to other cash flows that are relevant for investment decisions is shown for energy efficiency projects below (Box 2-1).

Overall, the available information shows that the impact of CER revenues on the economic performance of projects varies considerably between project types:

- **Non-CO₂ projects**, such as industrial gas abatement, manure management, waste water treatment, landfill gas utilisation and coal mine methane capture, are characterised by a medium to high impact of CER revenues. For several of these project types, CER revenues increase the IRR by more than 10 percentage points, and for coal mine methane projects even by more than 25 percentage points. For these project types, the CER revenues clearly make a difference, which indicates a higher likelihood of additionality.

- **CO₂ projects in renewable energy** such as wind and hydro projects are characterised by a relatively low impact of CER revenues: for wind power, the IRR increases by about 2.5% to 3%, for hydropower by about 3% to 4%, and for solar by about 1% to 1.5%. According to Lütken (2012), the annual CER revenues in relation to investment costs (median) amounted to 1.84% for wind and 3.5% for hydro. Given the typical uncertainties surrounding costs and load factor in renewable projects, this level of CER contributions seems relatively low to justify that the project would not have been implemented in the absence of the CDM. Therefore, in many cases, the additionality of projects within these types may seem rather unlikely (though in some cases it may not be ruled out that additional CER revenues of +3.5% may be the decisive factor rendering a project attractive – though it may not be possible to prove this in an objective way). In addition, many renewable energy projects – in particular hydropower – show a relatively high economic performance without CER revenues (e.g. an IRR of nearly 8% for hydropower without CER revenues), compared to non-CO₂ projects (e.g. landfill gas, coal mine methane and methane avoidance with an IRR of about 2% to 4% without CER revenues).
- **CO₂ projects in fuel switch, energy efficiency, and waste heat utilisation** are typically characterised by relatively low investment costs. Thus, CER revenues are higher compared to investment costs (5% for waste heat and 20% for fuel switch – median value). The impact of CER revenues on the internal rate of return is about 3 to 8 percentage points. However, in this project type, fuel prices are the decisive element determining its profitability. Box 2-1 compares the impact of typical fuel costs and CER revenues for energy efficiency projects. Our analysis indicates that CER revenues tend to have a low impact on project profitability. In addition, these project types show a relatively good economic performance without CER revenues, compared to non-CO₂ projects.

Lütken's analysis was based on a CER price of €12. Our analysis in Table 2-3 and Spalding-Fletcher's build on PDD data with similar CER price assumptions. With today's much lower CER prices, the low impact of CER revenues on CO₂ projects and therefore their high risk of non-additionality is further aggravated.

In conclusion, non-CO₂ projects are characterised by a medium-to-high impact of CER revenues and a relatively low economic performance without CER revenues, while for most CO₂ project types the impact of CER revenues is much smaller and the performance without CER revenues higher. Overall, this indicates that on average non-CO₂ projects have a higher likelihood of additionality.

Box 2-1: An analysis of the impact of CER revenues for energy efficiency projects

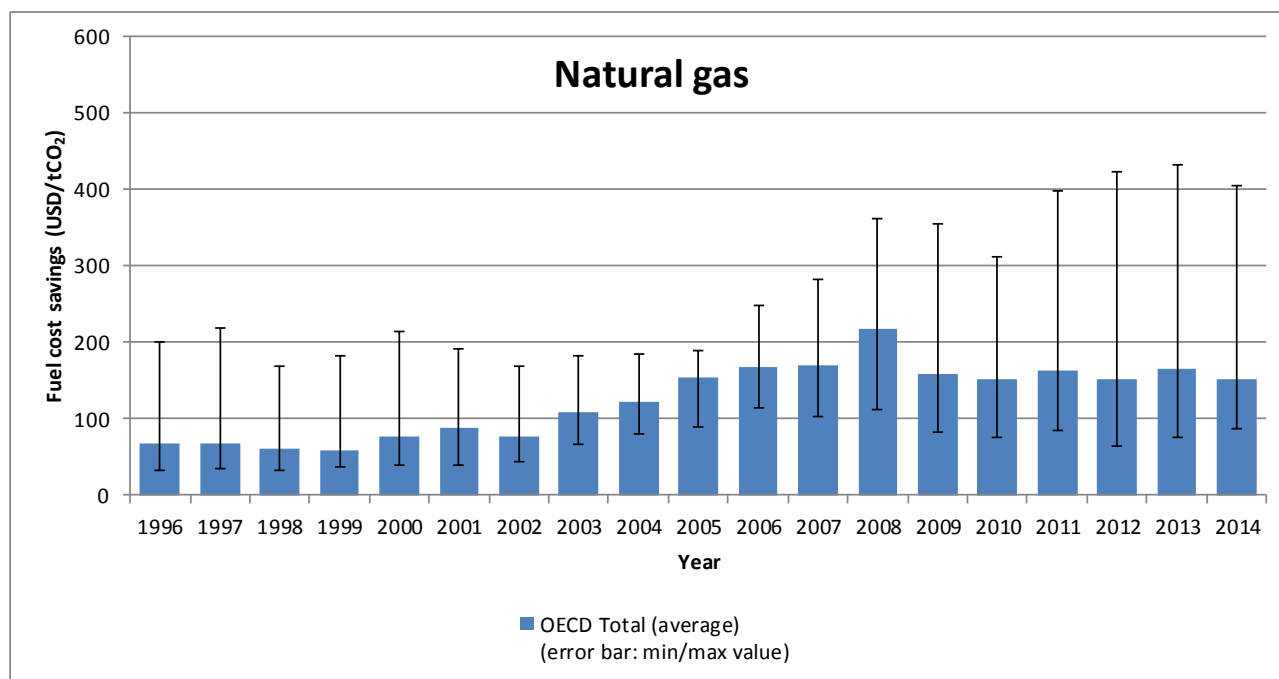
Another way of assessing the relevance of CER revenues in investment decisions is to compare them to other important revenues or savings in the investment analysis. For instance, for energy efficiency projects to become profitable, they have to (i) save sufficient costs for fossil fuels and (ii) earn sufficient CERs to pay back the investment costs for new equipment improving the energy efficiency. Figure 2-1, Figure 2-2 and Figure 2-4 illustrate the order of magnitude of fuel cost savings in relation to one tonne of CO₂ reduced or CERs generated in the case of projects saving natural gas, light fuel oil and steam coal. For instance, if an installation implements new equipment that reduces the specific consumption of natural gas and the related GHG emissions by one tonne of CO₂, then the related reduction in fuel costs in 2010 would amount to approx. 150 USD/tCO₂ (at OECD average prices in 2010). For light fuel oil, the fuel cost reduction amounts to over 250 USD/tCO₂ and for steam coal, the savings still amount to 37 USD/tCO₂ (in 2010). With this, it becomes obvious that the impact of fuel cost savings on the project cash flow is much higher than contribution from CER revenues.

Figure 2-1, Figure 2-2 and Figure 2-4 also show the development of average (and min. and max.) OECD prices over time, which illustrates the high variability of energy prices since 1996. Average specific energy prices have fluctuated in the order of 20 USD/tCO₂ (steam coal) to 200 USD/tCO₂ (light fuel oil). Also compared to the historic fuel price variability, typical CER revenues are low to negligible compared to fuel cost savings.

Please note that because of limitations in data availability, the figures are based on fuel prices in OECD countries, which in many cases also include taxes and may not be representative for all developing countries. In particular, in some developed and developing countries fossil fuel subsidies are very high. In these cases, because of the low prices, the fuel cost savings are low and may be on a similarly low level as the contribution from CER revenues to the positive project cash flow. However, in such a low price situation, the total positive cash flow may in any case be far too small to justify investments in energy efficiency equipment and the scope for CDM may become rather limited.

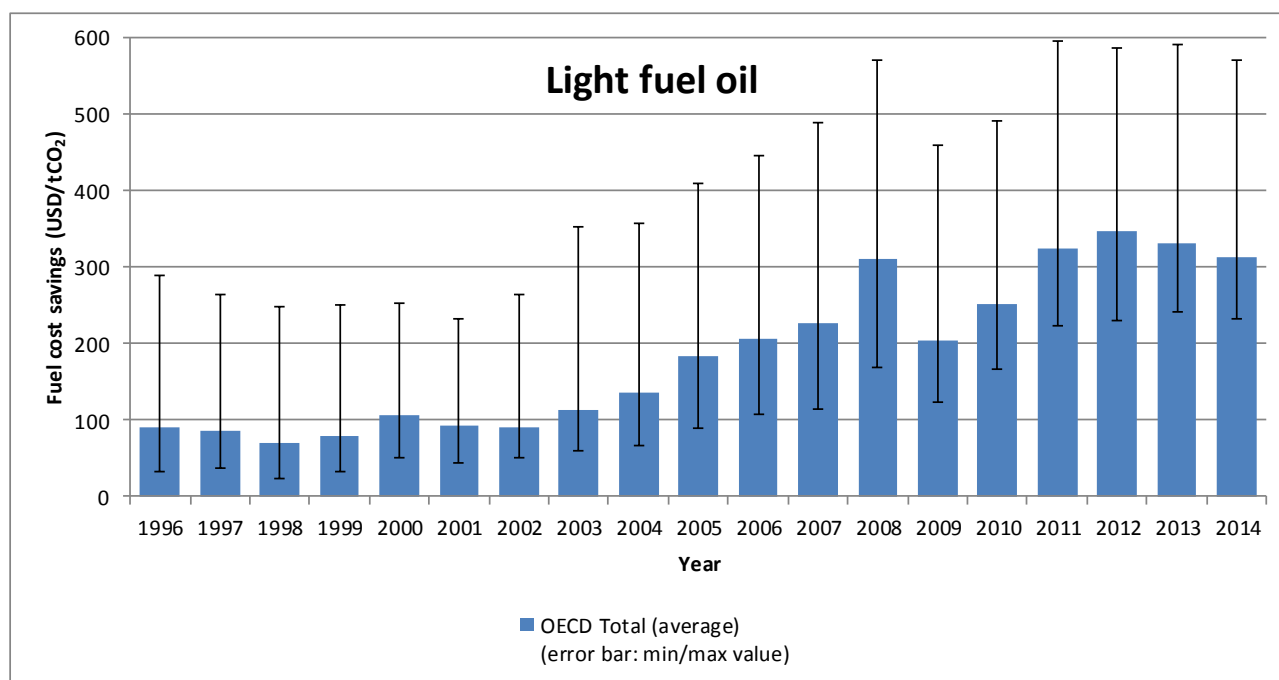
Overall, it may be argued that for projects to have a high likelihood of additionality the impact of CER revenues should at least be comparable to the main contributor to a positive cash flow, the related fuel savings. This would indicate that in such project types CER prices for energy efficiency projects would need to reach a level of at least 10-20 USD/tCO₂ for steam coal, 30-50 USD/tCO₂ for natural gas and 100-200 USD/tCO₂ for light fuel oil based systems (if prices on the level of OECD countries are assumed). With such CER prices, the economic contribution from CER revenues to positive cash flow reaches a level that may be considered significant (i.e. in the order of ¼ to ½ of fuel cost savings).

At prices significantly below this level, the economic impact of CERs is insignificant and the risk of non-additionality is very high.

Figure 2-4: Natural gas cost savings per tonne of CO₂ reduced in energy efficiency projects

Notes: Average fuel prices of OECD countries (in USD/TJ).

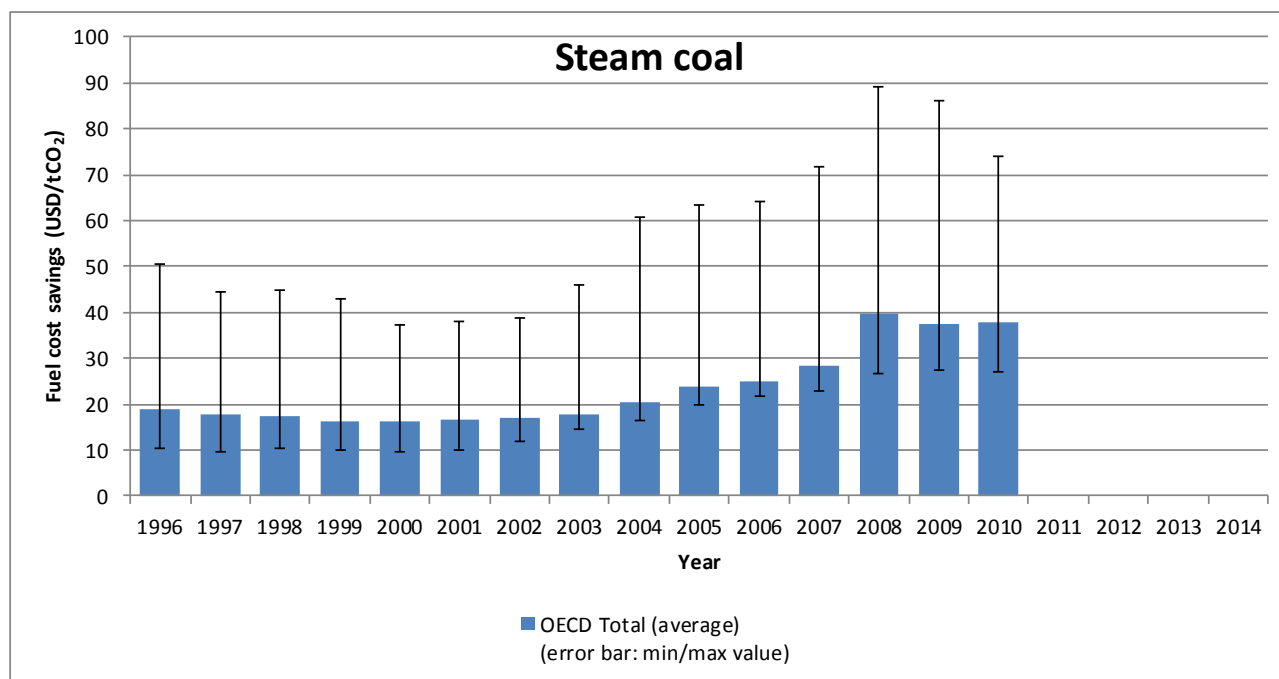
Sources: IEA 2015, IPCC 2006, authors' own calculations

Figure 2-5: Light fuel oil cost savings per tonne of CO₂ reduced in energy efficiency projects

Notes: Average fuel prices of OECD countries (in USD/TJ).

Sources: IEA 2015, IPCC 2006, authors' own calculations

Figure 2-6: Steam coal cost savings per tonne of CO₂ reduced in energy efficiency projects



Notes: Average fuel prices of OECD countries (in USD/TJ).

Sources: IEA 2015, IPCC 2006, authors' own calculations

3. Assessment of approaches for determining additionality and rules relevant towards additionality

3.1. Prior consideration

3.1.1. Overview

Prior consideration is a key requirement in the CDM. It aims to ensure that only projects are registered in which the CDM was seriously considered when the decision to proceed with the investment was made.

In the first version of the additionality tool prepared in 2004³, a provision was introduced for projects with a crediting period starting prior to registration, which stipulated that evidence has to be provided “that the incentive from the CDM was seriously considered in the decision to proceed with the project activity” and that the “evidence shall be based on (preferably official, legal and/or other corporate) documentation that was available to third parties at, or prior to, the start of the project activity.” The provision remained almost unchanged in the second version of the additionality tool in 2005.

In the third version of the additionality tool in 2007, the provision was removed and then included in the Guidelines for completing the PDD, which are applicable to all projects and not only those applying the additionality tool. These guidelines stipulated that “project proponents shall provide an implementation timeline of the proposed CDM project activity” and that “the timeline should include, where applicable, the date when the investment decision was made, the date when construction

³ EB 16, Annex 1: Tool for the demonstration and assessment of additionality.

works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started)". Also, according to the guidelines, "project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions"⁴.

In 2008, the CDM EB introduced general guidance on the demonstration and assessment of prior consideration⁵. The guidance was subsequently revised twice⁶, including further guidance for DOEs on how to validate real and continuing actions; in 2011 it was incorporated in the project standard (PS)⁷. According to the latest version of the project standard⁸, "if the start date of a proposed CDM project activity ... is prior to the date of publication of the PDD for the global stakeholder consultation, project participants shall demonstrate that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity". More specifically, project participants of project activities with a starting date on or after 2 August 2008 *"shall inform the host Party's designated national authority (DNA) and the secretariat of their intention to seek CDM status in accordance with the Project cycle procedure"*, while "for a proposed CDM project activity with a start date before 2 August 2008 and prior to the date of publication of the PDD for global stakeholder consultation, project participants shall demonstrate that the CDM was seriously considered in the decision to implement the proposed project activity". For this purpose, "project participants shall provide evidence of their awareness of the CDM prior to the start date of the proposed project activity, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project"⁹, *"provide evidence that continuing and real actions were taken to secure CDM status for the proposed project activity in parallel with its implementation"*¹⁰ and "provide an implementation timeline of the proposed CDM project activity. The timeline should include, where applicable, the date when the investment decision was made, the date when construction works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started). Project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions".

The CDM project cycle procedure¹¹ includes details about the notification process related to prior consideration (i.e. forms to be used, etc.). According to this procedure, for project activities with a start date on or after 2 August 2008, notification to the DNA of the host country and to the Secretariat must be made "within 180 days of the start date of the project activity". A list of notifications received by the Secretariat is available on the UNFCCC website.¹²

The requirements for demonstrating prior consideration set out in the project standard are generally applicable with the exception of programmes of activities (PoAs).

⁴ EB 41, Annex 12: Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM) (Version 07).

⁵ EB 41, Annex 46: Guidance on the Demonstration and Assessment of Prior Consideration of the CDM.

⁶ EB 48, Annex 61 and EB 49, Annex 22.

⁷ EB 65, Annex 5.

⁸ CDM project standard, Version 07.0, EB 79, Annex 3.

⁹ Relevant evidence could, for instance, relate to "minutes and/or notes related to the consideration of the decision by the EB of Directors, or equivalent, of the project participants, to undertake the project as a CDM project activity".

¹⁰ Relevant evidences "should include one or more of the following: contracts with consultants for CDM / PDD / methodology / standardized baseline services; draft versions of PDDs and underlying documents such as letters of authorization, and if available, letters of intent; emission reduction purchase agreement (ERPA) term sheets, ERPAs, or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds); evidence of agreements or negotiations with a DOE for validation services; submission of a new methodology or standardized baseline, or requests for clarification or revision of existing methodologies or standardized baselines to the EB; publication in a newspaper; interviews with DNA; earlier correspondence on the project with the DNA or the secretariat".

¹¹ Current version 07.0, EB 65, Annex 32.

¹² <https://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html>.

With regard to PoAs, the project cycle procedure includes the non-binding provision that *“the coordinating/managing entity may notify to the DNA(s) of the host Party(ies) of the PoA and the secretariat in writing of the intention to seek the CDM status for the PoA, using the [corresponding form] for the purpose of determining the start date of the PoA”*. According to the CDM project standard, the start date of a PoA is either *“the date of notification of the intention to seek the CDM status by the coordinating/managing entity to the secretariat and the DNA”* or *“the date of publication of the PoA-DD for global stakeholder consultation”*. With regard to CPAs, *“the start date of a CPA is the earliest date at which either the implementation or construction or real action of the CPA begins”* and it shall be confirmed that *“the start date of any proposed CPA is on or after the start date of the PoA”*. The only exception to this rule relates to afforestation and reforestation (A/R) PoAs, which allows *“the inclusion of any A/R project activity that started after 1 January 2000 but has not been registered as a CDM project activity as a CPA in an A/R PoA”*.¹³

3.1.2. Assessment

The issue of projects obtaining registration as CDM projects without serious consideration of the CDM benefits at the time of the investment decision was especially a concern during the first years of the CDM. The requirement to demonstrate prior consideration was only gradually introduced over time and became generally applicable only in 2007. Also, as pointed out by Schneider (2007), the requirement was also not always followed: only 36% of the projects seeking retroactive crediting provided evidence that the CDM was considered in the decision to proceed with the project and it is reported that relevant documentation has been backdated. It can, therefore, be concluded that for early CDM projects, the demonstration of prior consideration was questionable.

The approach applied as of August 2008 (i.e. for the bulk of projects and generated CERs) requires notification of the prior consideration of the CDM as well as, in situations of delay, evidence of continued interest in the CDM using a form designed for this purpose. This requirement addresses the issue of prior consideration in a more objective and appropriate manner, avoiding the risk of back-dating of company-internal information or subjective claims of prior consideration. In this regard, the rules have improved over time and there is no evident flaw in the current rules and therefore no need for the current practice to be changed.

However, it should be noted that the notification of prior consideration ensures that projects cannot claim CDM registration retroactively, but does not demonstrate whether or not a project is additional. In this regard, this rule does not provide any information on the additionality of projects since both truly additional projects and free riders may apply for the CDM status. This rule is therefore important to exclude projects which did not consider the CDM at all and are therefore clearly not additional, but it is not sufficient for assessing whether a project can be considered additional or not.

With regard to the practical implementation, a period of 180 days for notification of prior consideration can be considered quite generous. While a certain grace period is certainly reasonable due to the administrative process of making the PDDs available for global stakeholder consultation, a period of six months could mean that the project is already quite advanced, which would then call into question whether CDM benefits were actually necessary for the project to proceed. A long grace period could therefore be regarded as allowing retroactive crediting.

The requirements regarding the start date of PoAs and CPAs are sufficiently strict to avoid any project activity that has already started being registered as CPAs under a PoA. The only rule that cannot be considered adequate relates to the inclusion of old A/R activities in a newly registered

¹³ Clarification "Start date and crediting period of component project activities under an afforestation and reforestation programme of activities", EB 73, Annex 16.

A/R PoA (see above). For these A/R activities, CDM rules do not require demonstrating prior consideration of the CDM.

3.1.3. Summary of findings

There is no evident flaw in the general design of this rule with the exception of the inclusion of old A/R activities in a newly registered A/R PoA. Also, as outlined above, the time frame for notification of prior consideration appears to be quite generous.

3.1.4. Recommendations for reform of CDM rules

The only rule that needs to be changed relates to the inclusion of old A/R activities in a newly registered A/R PoA (see above). It is therefore recommended that the corresponding rule be withdrawn.

Furthermore, it is recommended that the time frame for notification of prior consideration be shortened in order to reduce the risk that projects apply for the CDM having only learned of the possibility after the project has started. The grace period for notification to the secretariat should therefore be reduced in general, e.g. to a maximum of 30 days after the project start.

3.2. Investment analysis

3.2.1. Overview

The CDM's *additionality tool* requires demonstration that a prospective project is either not financially viable without the CDM (using investment analysis) or that there is at least one barrier preventing the proposed project without the CDM (using barrier analysis). Though both methods are common (and some projects use both), investment analysis is the most widely used, by over three-quarters of all projects and over 90% of the renewable energy (especially hydro and wind) projects that are expected to dominate future CER supplies (Spalding-Fecher & Michaelowa 2013). Investment analysis (or a variation of it) is also used in the *combined tool* and in some CDM baseline and monitoring methodologies that refer neither to the *additionality tool* nor to the *combined tool* for demonstrating additionality.

The additionality tool provides three alternative options for conducting investment analysis:

- For projects with costs but no revenues (other than CERs), a **simple cost analysis** can be used to demonstrate that at least one scenario (other than the project) is less costly. This approach is quite common for a few project types (e.g. projects that capture N₂O from adipic acid plants, or methane from landfills), but it is not common overall.
- The **investment comparison analysis** compares the economic attractiveness of the project without revenues from CERs to other investment alternatives that provide similar outputs or services; this approach is common for just a few project types (e.g. higher-efficiency fossil power), and is not common overall.
- The **benchmark analysis** is used to demonstrate that a proposed project is, without revenues from CERs, economically not attractive (i.e. it does not meet a stated financial benchmark); this approach is, by far, the most common form of investment analysis.

In all cases, investment analysis relies on the premise that, if a project is not a better investment (or less costly) than an alternative or a financial benchmark, then it would not have proceeded but for the existence of the CDM. Exactly how the CDM causes it to proceed, whether through CER revenue or otherwise, does not need to be specified.

The approach to investment analysis has also been refined over time. In particular, in 2008 the CDM EB adopted “Guidelines on the assessment of investment analysis”, which aimed to provide further clarity and reduce ambiguity by, for example, clarifying how to calculate the common financial benchmarks net present value (NPV) and internal rate of return (IRR) and suggested ranges for conducting sensitivity analysis in these parameters. In 2011, this guidance was further revised to introduce default values for the expected return on equity for different project types and host countries, which can (but are not required to) be used by project developers as benchmarks for the benchmark analysis.

3.2.2. Assessment

The expected financial performance of a project is clearly one important factor in determining whether or not it will proceed (see further discussion of this in Section 2.3). For example, unless mandated by an (enforced) government policy, there is little reason for projects with no revenue (other than CER values) to proceed, simplifying the assessment of additionality.

For projects that do collect revenue other than CER values, such as by selling electricity, the CDM rules seek to determine whether the project would not have been financially attractive (and therefore not have proceeded) without the CDM. Researchers have raised several critiques of this approach, which we address in this report under two broad themes.

The first is perhaps the most fundamental, and is whether investment analysis is appropriate for investments that may be driven largely by other (non-economic) factors. This critique asserts that many investments in common CDM activities – e.g. power generation – are undertaken for a host of political, social, and strategic reasons that extend beyond simple project-level economics and may not be designed to maximise economic return. Such critics argue that a market-based test such as investment analysis is not applicable in what is largely a non-market environment, perhaps especially so in centrally planned countries such as China (He & Morse 2010). For example, Bogner & Schneider (2011) and Haya & Parekh (2011) have argued that governments have already subsidized and developed large hydroelectricity projects in developing countries well before the CDM, making them financially viable and therefore raising questions about the extent to which investment analysis can credibly determine that they would not proceed but for the incentive provided by the CDM. For investment analysis to function properly – indeed, for any additionality test to function properly – it must be able to demonstrate, with high confidence, that the CDM was the deciding factor for the project investment. For project types that are routinely constructed outside the CDM, including (but not exclusively) for broader economic, energy security, or political reasons, it remains highly difficult to determine with confidence that, in any particular case, a project's financial returns are the reason it is not proceeding and that the financial incentive provided by the CDM is the reason for it proceeding (Dechezleprêtre et al. 2014).

Table 4-5 provides an example of how the decision of selecting a certain fuel (coal, fuel oil or natural gas) may depend on many factors that are not only insufficiently covered in an investment analysis, such as level of initial investment or flexibility in operation that may lead, for example, in investment in a natural-gas-fired boiler rather than a coal-based one, even though natural gas may be more costly than coal in terms of direct costs.

The second critique is concerned with transparency, subjectivity, and information asymmetry, such as whether project developers provide sufficient and credible information to allow replication of their calculations and justification of their conclusions, as well as the inherent information asymmetry between project developers and those, especially the CDM EB, tasked with reviewing the information. For example, early research found that project developers regularly provided investment analyses that were opaque, relied on proprietary company information, or were incomplete (Schneider 2009).

This analysis takes a new look at several aspects of this second critique, including:

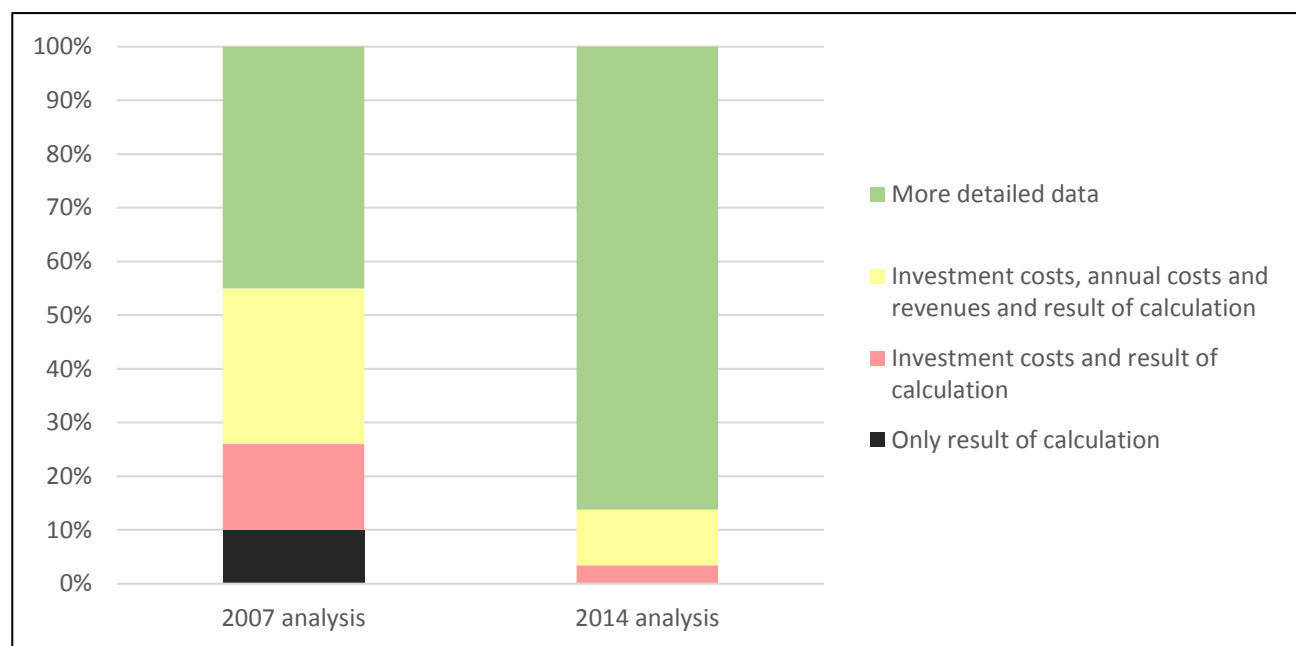
- Transparency, by re-visiting the prior work of Schneider (2009) to gauge how transparently developers conduct the investment analysis.
- Subjectivity and asymmetry, with a new exploration of benchmark rates and CER prices.

These two broad topics are addressed in turn below.

Transparency

To explore transparency in investment analyzes, Figure 3-1 updates the analysis of Schneider (2009) who reviewed a randomly selected group of PDDs for the level of information provided. In our updated analysis, 29 registered projects using the investment analysis were selected at random.¹⁴ Over 90% of the projects selected were registered after 2007, the year of Schneider's prior analysis, so this sample can indicate how practices have changed. In particular, over 80% of the 29 projects in this new analysis provided detailed input data to support their calculations of capital and operating costs and revenues, compared to 2007, when fewer than half did. Furthermore, no projects provided only the result of their calculation in this analysis, with no input data to support their findings. These findings suggest that investment analysis has become more transparent.

Figure 3-1: Level of information provided in PDDs on the investment analysis



Notes: 2007: n=31, 2014: n=29.

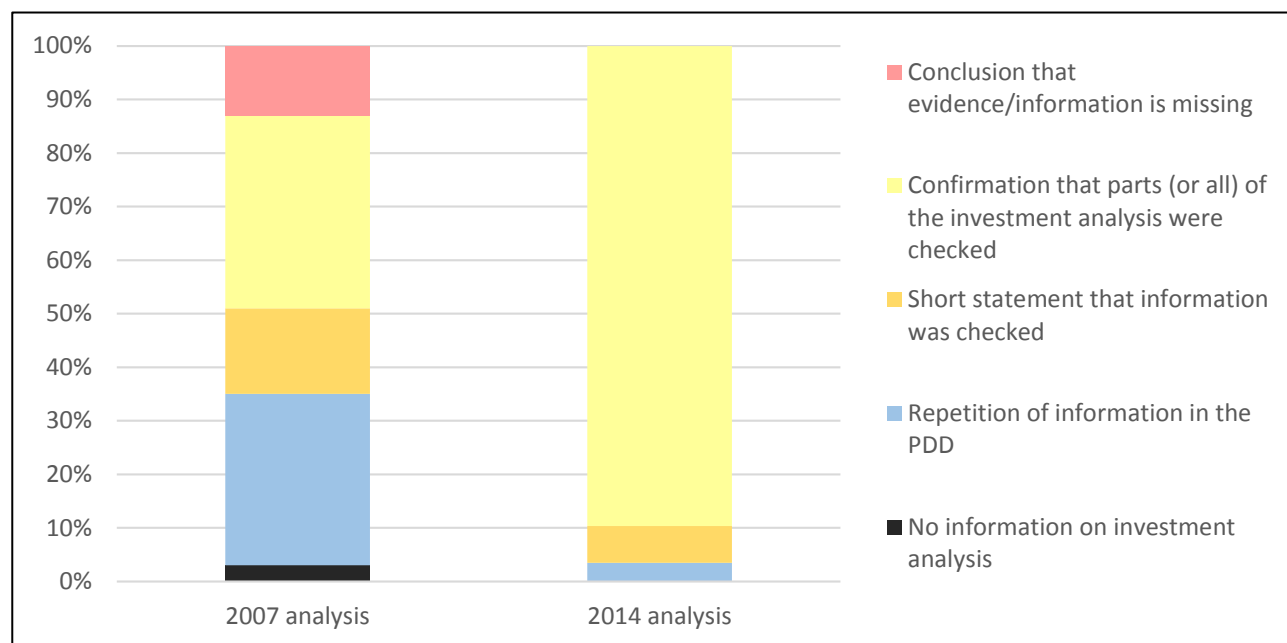
Sources: Schneider (2009), authors' own calculations

Validation reports that review the investment analyzes also appear to have become more thorough. Figure 3-2 also returns to Schneider's prior analysis to update it based on the same randomly selected group of projects as in Figure 3-1. As seen in Figure 3-2, more than 80% of the validation reports confirm that validators checked some or all of the key assumptions of the investment analyzes. The validation reports often review each of several of the most critical investment analy-

¹⁴ According to the sampling design, 30 projects using investment analysis were to be selected. Upon further examination, one of the thirty projects selected, a small-scale, run-of-river hydropower plant, had demonstrated additionality using other methods, as outlined in the "Guidelines for Demonstration Additionality of microscale project activities" and so was not considered in this analysis.

sis inputs and describe that the inputs are reasonable, in many cases citing contract or other documents reviewed to support the choice of inputs.

Figure 3-2: Information in validation reports on the investment analysis



Notes: 2007: n=31, 2014: n=29.

Sources: Schneider (2009), authors' own calculations

Subjectivity and information asymmetry

Despite the findings above, transparency and validator review of the input parameters do not remove subjectivity or choice of alternate input parameters in different contexts. For example, in some cases, project proponents have used different values for key input parameters when submitting applications to financial institutions (Haya 2009), suggesting that the metrics used (and choice of inputs therein) and reliability of such may vary. Indeed, project developers will always have much more information on the project's local conditions – including costs and technical parameters – than will outside parties, whether validators or CDM administrators, and therefore have an incentive to provide biased or inaccurate information to increase the chance of a successful additionality determination and, therefore, the eventual awarding of credits to their project (Gillenwater 2011). This phenomenon is widely referred to as '*information asymmetry*'. As shown above, validators do have more information at their disposal now than in the past, but still lack an objective basis for determining that the investment would not have been undertaken and that inputs provided are the same as they would have been had CDM credits not been sought. Small changes in a number of input parameters – even if individually well within the range of other similar projects (CDM or not), could lead to significant changes in the overall stated financial return of the project. Interestingly, under the CDM, project participants do not need to provide any confirmation that they are submitting truthful information. Some project developers reported that different versions of investment analysis were used for CDM purposes and for the purpose of securing other funding for a project (e.g. loans). Other crediting mechanisms, such as the VCS and CAR, require declaration or attestations from project developers that all information is accurate and presents the truth. To explore further the issue of subjectivity and information asymmetry in input parameters, we take a deeper look at two particular inputs: benchmark rates and CER prices.

Closer examination of benchmark rates

This critique concerns appropriate levels for financial benchmarks (e.g., IRR) (Michaelowa 2009). To explore this question, we reviewed data on IRR benchmarks used by wind, hydro, biomass, and waste gas or heat projects in China, wind and hydro projects in India, and hydropower projects in Vietnam.¹⁵

Nearly all projects in China use standard, government-issued IRR benchmarks. By far the most common benchmark used is 8%, which is applied for most power projects, and derives from a 2002/2003 Chinese government source, *Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*. Other common benchmarks based on government rules include 10% for small hydro projects, and 12-13% for waste gas/heat projects.

Table 3-1: Summary of most common benchmark rates used in IRR analysis in Chinese CDM projects

Project type	Common IRR benchmark	Fraction of projects using this benchmark	Source of this benchmark
Wind	8.0%	99%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
Hydro	10.0%	71%	Government's <i>Economic Evaluation Code for Small Hydropower Projects</i> (1995)
	8.0%	29%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
Biomass	8.0%	98%	Government's <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> (2002/2003)
Waste gas / heat	12.0%	30%	Government's <i>Economical Assessment and Parameters for Construction Project, 3rd edition</i> (2006)
	13.0%	17%	Government's <i>Economical Assessment and Parameters for Construction Project, 3rd edition</i> (2006)
	18.0%	16%	Conch Cement Company internal WACC

Notes: In this table, and throughout this section, we report IRR benchmarks and values based on analysis of IGES's investment analysis database. We believe that most of the benchmarks, and values reported in the database, are in real terms, based on a review of a small number of PDDs and the assumption in the CDM's Guidelines on the Assessment of Investment Analysis that is conducted in real terms. We make no attempt to identify or convert values in the database that may be in nominal terms.

Sources: IGES 2014, authors' own calculations

Despite the ubiquity of the 8% government-set threshold in China, it is not clear how or why it matches the internal thresholds used by actual project inventors, who may themselves demand returns either higher or lower. (For example, benchmarks for wind power projects in India, where they are determined to a greater extent by investor hurdle rates, are more variable and, on average, higher). For this reason, it is not clear why 8% is the 'correct' benchmark for a test intended to gauge the attractiveness of an investment. Furthermore, it is not clear why common benchmarks used for hydro or waste gas are higher (10% or at least 12%, respectively), and whether these

¹⁵ These project type / country combinations were selected because each of them represents at least 1% of the registered projects in the CDM that use investment analysis (IGES 2012). Though this 1% threshold is arbitrary, it provided us with a basis for focusing the analysis.

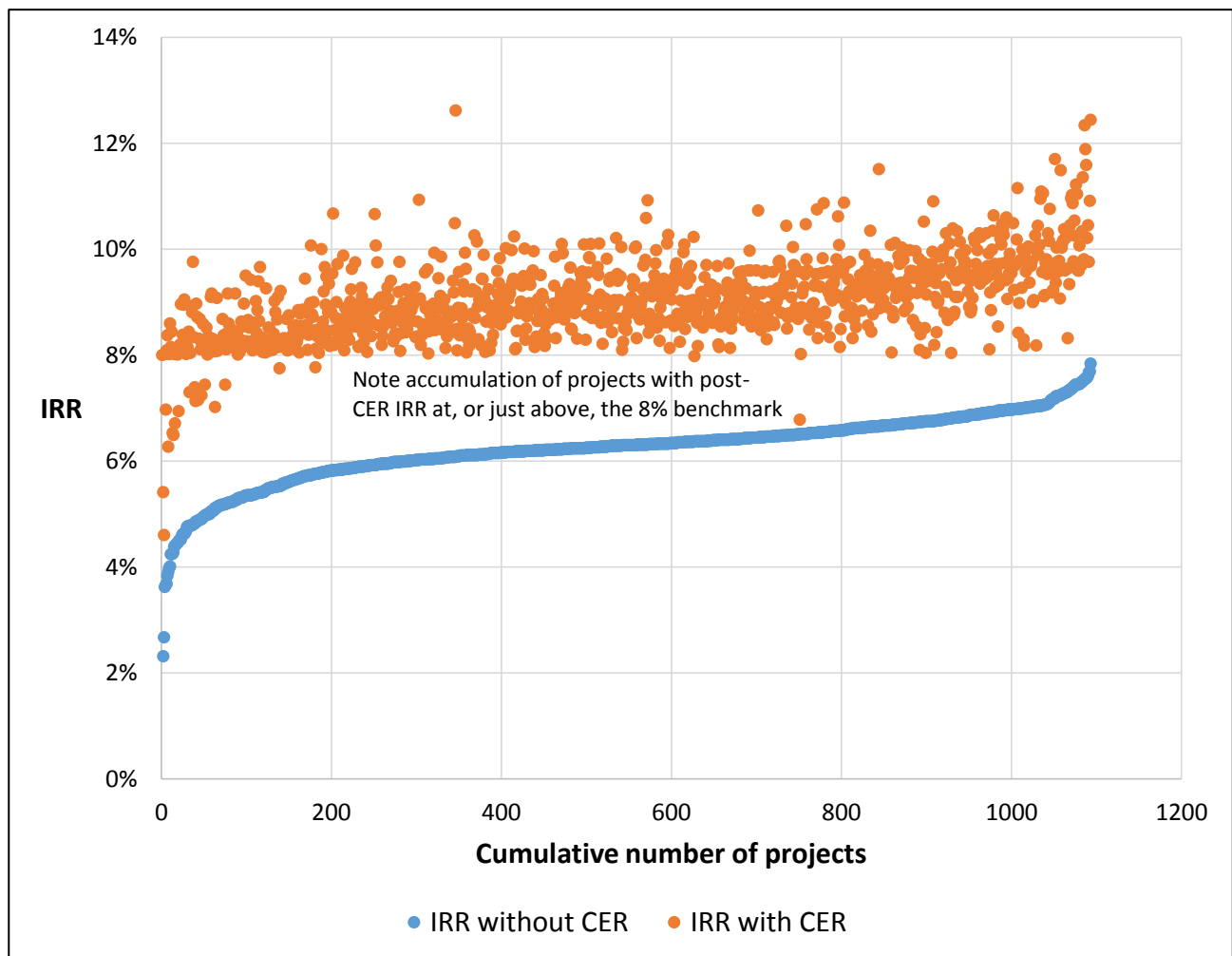
rates accurately capture the risk and expected financial returns in these types of projects. Further analysis of this issue may be warranted, e.g. by comparing it with other sources of equity rates for different investments in China or for similar projects in other countries. A source of such data for projects within China was not immediately known, however.

In principal, the logic of investment analysis is that the project would not have proceeded but for the financial incentive provided by the CDM. That financial incentive is the value of CERs. Many project developers conduct an analysis to show that, at assumed CER prices, the financial return of the project is expected to clear the financial benchmark used. However, this is not actually required by the additionality tool. (In the first versions of additionality, a step 5 'impact of the CDM' was included, which was interpreted by many project developers as an obligation to show that the project is made economically attractive through the CDM. This was later removed).

The above discussion investigated benchmarks used in China, with special attention paid to the widely used 8% benchmark. Because of its ubiquity, this 8% benchmark provides an opportunity to investigate the extent to which CER values indeed bring about expected project returns above this value and therefore, in the logic of the investment analysis, enable the project to proceed. As stated above, though projects are not required to actually show that CER values would push the project above its stated threshold, most do report results of expected return.

The following chart (Figure 3-3) shows the stated IRRs before and after CERs for all wind projects in China that use a benchmark of 8%. As seen in the figure, most of these projects state an IRR without CERs of between 6% and 7%, and an IRR after CER value of 8% to 10%. Note in particular the sharp line at 8%, at which very few projects claim an after-CER IRR of just under 8%, but a large number of projects find a post-CER IRR of just barely more than 8%.

Figure 3-3: Stated IRRs of Chinese wind projects using a benchmark of 8% before and after assumed CER value



Sources: IGES 2014, authors' own calculations

In principle, one explanation for this distribution is that projects in which the 8% threshold is not reached with CER revenues are not implemented, do not apply for CDM registration, and are therefore not represented in this graph. The fact that so many projects just barely meet the 8% threshold (even though they are not required to do so), and so few do not meet it, may instead indicate, however, that project developers are eager to claim that the CER value has allowed the project to clear the benchmark rate.

In contrast to the situation in China where standard government benchmarks are provided, most projects in India use internal, company-specific required rates of return as their IRR benchmarks. However, as in China, the CER value tends to provide a similar increase in expected return (e.g., an increase in IRR of two to three percentage points), just clearing the stated benchmark.

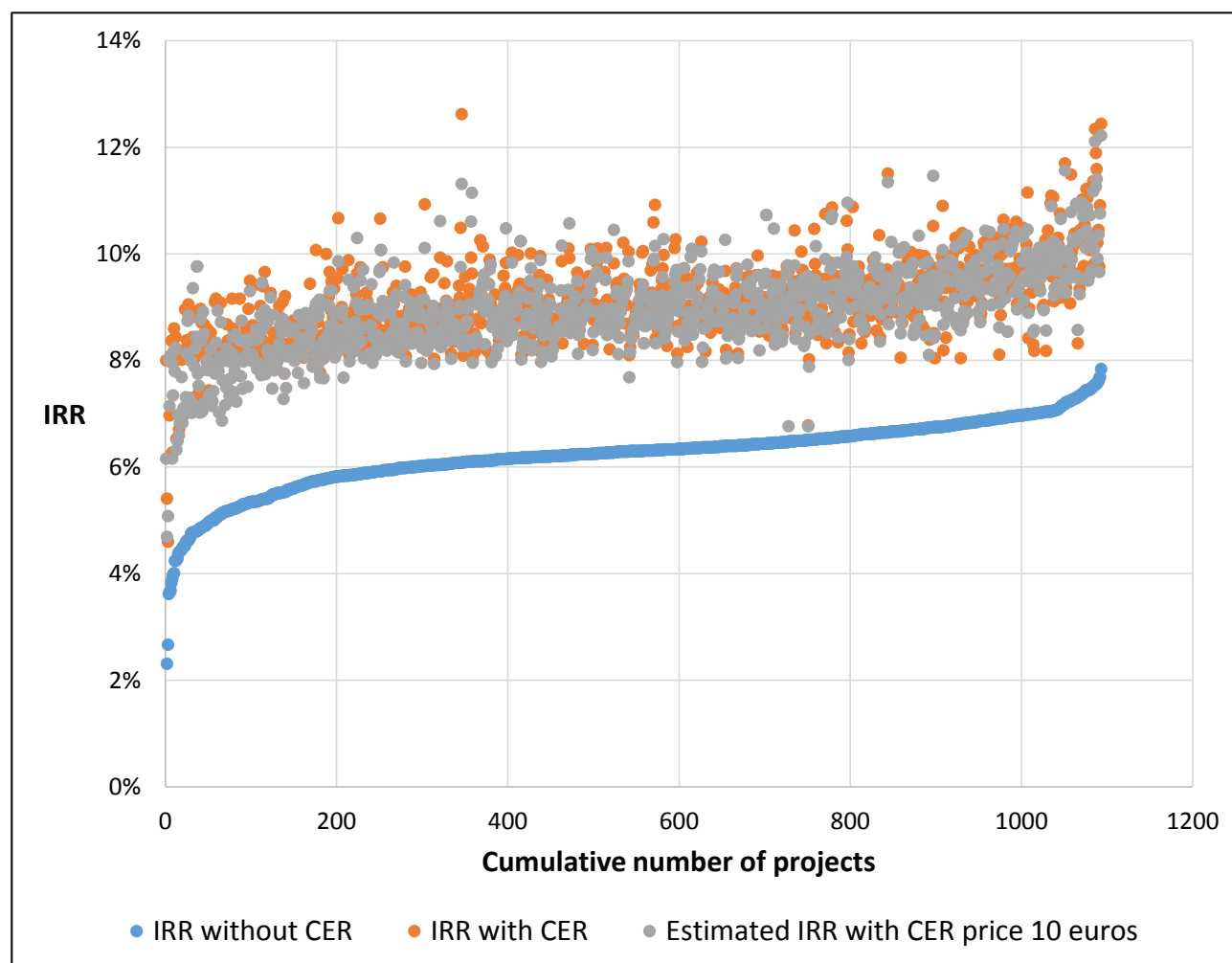
To demonstrate that projects just clear the benchmarks, project developers could select project input parameters so that the benchmark is achieved. These parameters could include CER price, load factor, electricity tariff, or a number of other inputs required in calculating an IRR.

One such parameter that could be adjusted is the expected CER price, which rose consistently through mid-2008, then fell precipitously, and for which forecasts have varied widely since, providing a potentially broad scope for selecting possible future CER prices.

Closer examination of selection of the CER price

To explore the potential effect of the CER price in more detail, Figure 3-4 adjusts the post-CER values stated in the PDDs (as displayed in Figure 3-3) to use a common CER value of €10 for all projects. (€10 is the median value used across all registered projects.) In this example, a large number of projects no longer meet the 8% benchmark. In particular, about 70 projects with pre-CER IRRs of 4% to 6% used CER prices as high as €17 in order to claim they would meet the 8% benchmark. Though this represents just a small share (about 1%) of wind power projects in China, it strongly suggests that input parameters (CER values) have been chosen to achieve the desired result of the 8% government-set IRR benchmark.

Figure 3-4: Estimated IRRs of Chinese wind projects using a benchmark of 8% before and after CER value of €10



Sources: IGES 2014, authors' own calculations

Similar to the situation for Chinese wind power projects discussed above, a number of Indian wind projects that claimed that CER values (median price assumed: €14) would lead them to exceed their benchmark would not have been able to claim that their benchmarks are met if they had used

a lower, and more common, CER price of €10. This suggests that, as found in the case of wind power projects in China, project developers in some instances may select CER values that depart from values used by their peers in order to claim that CDM revenues will make the projects financially attractive.

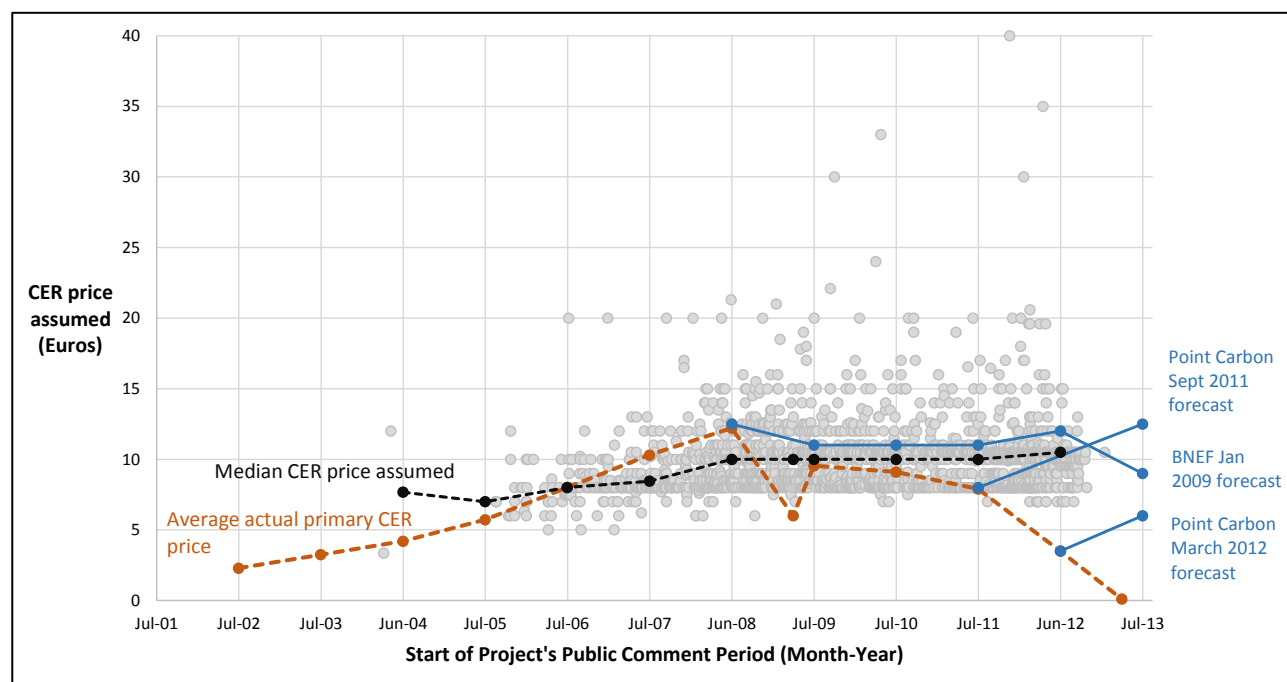
A similar pattern emerges for hydropower projects in Vietnam, where benchmarks (averaging 13.1%) were derived either as the weighted average cost of capital (WACC) or a stated commercial lending rate.¹⁶ Of the projects analyzed¹⁷, over half of the hydro projects would not have met their benchmarks if they had used a CER price of €10 instead of higher prices (median price assumed: €15.5, and as high as €30, in contrast to the remainder of Vietnamese hydro projects with median price assumed of €10). As above, while this is not definitive evidence of gaming, it suggests that project developers tend to invoke higher CER prices than their peers when needed to claim that their projects become economically viable under the CDM.

This raises the question of the plausibility of CER prices used by project developers. Looking at all registered projects (Figure 3-5), it appears that the CER prices used by project developers, though highly variable, tended to track then-current primary CER prices, through 2010, when CER prices began a steady decline. Project developers did not then use lower prices, but neither did industry analysts, who forecasted that higher prices would return.

These trends therefore display little evidence that project developers have systematically over- or under-estimated expected CER prices, at least as judged by the median (black line) values. However, the distribution of prices around that median displays a skew wherein a small fraction of projects use very high prices, perhaps because, as shown above, such high prices may be needed to demonstrate that these projects have met benchmarks.

¹⁶ In Vietnam, the median IRR benchmark used by projects in Vietnam was 13.1%, and most benchmarks were derived either as the weighted average cost of capital (WACC) or a stated commercial lending rate. The default expected return on equity for power projects in Vietnam, per the CDM's *Guidelines on the Assessment of Investment Analysis*, is 12.75%; 60% of power projects in Vietnam use an IRR benchmark higher than this rate; 5% have an IRR without a CER value exceeding this.

¹⁷ From the IGES investment analysis database, all hydro projects in Vietnam were selected that reported CER price assumptions in € as well as pre- and post-CER IRR values.

Figure 3-5: CER prices – assumed and estimated


Notes: CER prices assumed by project developers (grey dots) have been relatively consistent with industry forecasts made at the time (blue lines), even though they have been higher than market prices (orange line) since 2008.

Sources: IGES 2014, Point Carbon 2011, Point Carbon 2012

Sensitivity analysis: can it help address subjectivity?

The CDM addresses the subjectivity of input parameters, in part, through the use of sensitivity analysis required in investment analysis. As specified in the *Guidelines on the assessment of investment analysis*, “variables...that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation ... and the results of this variation should be presented.” However, the guidelines do not require that parameters be varied simultaneously, and few project developers do so. For example, in calculating project IRRs (in the PDDs), no project developer of the 30 randomly selected projects assessed the possibility that more than one of the key input variables could vary simultaneously. Furthermore, nearly all claim that even the standard variations of as much as 10% in the individual parameters are implausible, despite evidence (as presented here) that variation in the input values used is quite common. Accordingly, because the possibility that individual parameters could vary widely is discounted, and the possibility that multiple inputs could vary is not considered, the sensitivity analysis as currently applied is not sufficient to address the subjectivity in these parameters.

3.2.3. Summary of findings

Investment analysis is designed to determine whether a project would be uneconomical or less attractive than an alternative in the absence of the CDM. The premise is that if the project is not economical (most often as compared to a particular investment threshold), it would not have proceeded. From a strictly financial perspective, this may well be the case. However, researchers have pointed out that several types of projects in the CDM – especially large power projects that dominate the CDM pipeline – are pursued for reasons that extend beyond simple financial return, particularly in the largely non-market regulatory environments that are found in some of the largest CDM countries. This may be the most fundamental critique of investment analysis, and yet it is also the most analytically challenging to prove or disprove. Projects may proceed for a variety of

factors – economic, strategic, and social – that defy attempts to attribute the viability, or failure, to any one factor. Complicated statistical tests have been proposed – and some statistical research has been attempted – but few compelling approaches have yet emerged.

This research has further explored the issues of information asymmetry, transparency, and subjectivity of input assumptions. Regarding information asymmetry, project developers have considerably more information about their own project than do those – likely including validators – that are charged with reviewing and assessing their additionality. Regarding transparency, this research finds that, since 2007, the transparency of both project design documents and validator assessments has increased markedly, such that the strong majority of projects now include detailed information on input assumptions that their investment analysis could be replicated.

In some cases, there is little reason to question the validity of these input assumptions, as they are based on contract documents (e.g. with equipment providers that would seem to reflect actual prices paid). In other cases, the input assumptions are highly subjective, as in estimates of future fuel prices (e.g. for biomass), electricity tariffs that may be adjusted, or CER prices. In particular, this research has identified dozens of cases in China, India, and Vietnam in which it appears that project developers have used CER prices higher (in some cases, much higher) than their peers in order to claim that the CDM would make their project exceed the chosen financial benchmark. This demonstrates how eager some project developers may be to select input values to give results that would give the appearance of additionality.

3.2.4. Recommendations for reform of CDM rules

As stated above, for an additionality test to function properly, it must be able to demonstrate with high confidence that the CDM was the deciding factor in project implementation. This analysis has demonstrated that the subjective nature of the investment analysis limits its ability to provide that confidence. It is possible that improvements could decrease this subjectivity, such as by applying more complicated tests to assess the true motivations and financial performance of the project. Still, doubts may remain, especially for project types for which the financial impact of CERs is insufficiently large relative to variations in other potential inputs to provide a strong ‘signal-to-noise’ ratio, such as for large power projects. CDM administrators may therefore want to consider whether certain project types, if they cannot be confidently deemed additional by other tests (e.g. barrier analysis, common practice analysis, as in the next sections of this report), might be phased out of the CDM. If the investment analysis continues to be applied, we recommend further improving the guidance to reduce subjectivity. CDM rules could also require formal declarations by the project participants that information is true and accurate. Such declarations may discourage project participants from providing false information, as a violation of such a declaration may have consequences under national legislation. An even stronger form could be a declaration in lieu of an oath.

3.3. First of its kind and common practice analysis

3.3.1. Overview

The CDM uses two approaches to assess additionality based on the market penetration of technologies: the first-of-its-kind approach and the common practice analysis. Under the first-of-its-kind approach, a project is deemed automatically additional if certain conditions apply. The common practice analysis often complements the investment or barrier analysis. It requires an assessment of the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region. It is a credibility check to demonstrate that a project is not common practice in the region or country in which it is implemented. The common practice analysis can also be used to demonstrate that the baseline technology or practice is frequently implemented and is hence a realistic scenario. The common practice analysis is only relevant for large-scale

projects. Small-scale projects are entitled to use simplified modalities and procedures for small-scale CDM project activities, which do not require common practice analysis.

The first-of-its-kind approach was initially applied as part of the barrier analysis; it was sometimes also referred to as the barrier of lack of 'prevailing practice'. In 2011, the EB adopted guidelines specifying how first-of-its-kind should be demonstrated. The guidelines were further revised in 2012 and reclassified as a tool in 2015.¹⁸ Showing that a project is the first-of-its-kind is the first step in the additionality tool and combined tool, which stipulate that if a project is the first-of-its-kind, it is considered additional. The steps to be followed for demonstrating first-of-its-kind are further specified in the corresponding guidelines and, since 2015, the methodological tool. According to version 03.0 of the tool, a project activity is "first of its kind in the applicable geographical area" if

- "the project is the first in the applicable geographical area that applies a technology that is different from technologies that are implemented by any other project" with the same output and that "have started commercial operation in the applicable geographical area before" the PDD "is published for global stakeholder consultation or before the start date of the proposed project activity, whichever is earlier", if
- "the project implements one or more of the measures" and
- "the project participants selected a crediting period for the project activity that is "a maximum of 10 years with no option of renewal".

The common practice test was first introduced in the additionality tool in 2004 to complement the investment and barrier analyzes, as a safeguard to ensure the environmental integrity of the CDM. In a first step, other previous or current projects which are similar to the project activity were analyzed. Projects were considered similar "if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc." Other CDM projects were excluded from this analysis. In case similar activities were identified, it was necessary to justify why these exist, while the project activity is considered to be financially unattractive or as facing barriers. 'Essential distinctions' had to be identified which may for instance be due to the fact that new barriers have arisen or promotional policies have ended.

For both the first-of-its-kind approach and the common practice analysis, the key issues are defining what is regarded as a comparable technology, what the appropriate geographical scale is and what threshold should be used for a technology to be regarded as first-of-its-kind or common practice. Critics pointed out that no clear definitions of when a project activity should be regarded as common practice were given in the early versions of the additionality tool (Schneider 2009). Another criticism was that the common practice test allows project developers to claim that a frequently implemented project type is not deemed common practice if they can justify 'essential distinctions' from other projects. Yet the key terms 'similar' and 'essentially distinct' were defined so vaguely that any project could be argued to be not common practice, simply by defining 'similar' very narrowly or 'distinct' very broadly (Schneider 2009; Spalding-Fecher et al. 2012).

The requirements for the common practice analysis in the additionality tool remained largely unchanged until September 2011 when the "Guidelines on Common Practice" were introduced, incorporating elements from the additionality tool and providing additional guidance¹⁹. In parallel to the revision of the "Guidelines on first-of-its-kind", the "Guidelines on Common Practice" were further revised in 2012 and reclassified as a tool in 2015.

¹⁸ Methodological tool. Additionality of first-of-its-kind project activities (version 03.0).

¹⁹ The new requirements of the Guidelines on Common Practice were then also incorporated in the additionality tool in the same year.

Both guidelines or tools are applicable to four GHG reduction activities, namely, “fuel and feedstock switch, switch of technology with or without change of energy source (including energy efficiency improvement), methane destruction” and “methane formation avoidance”²⁰. Both also use similar approaches for defining similar or different technologies and the appropriate geographical area.

In the 2011 version of the common practice guidelines, the first step was to calculate the applicable output range as $\pm 50\%$ of the capacity of the project activity. In the next step, all existing plants in the geographical area within this capacity range needed to be identified (with the exception of registered CDM projects). The default applicable geographical area was the entire host country. If the technology was not country-specific, the geographical area should be extended to other countries. If projects differ significantly between locations, the geographical area could also be smaller than the host country. In the next step, among the identified projects, those with different technologies from the project activity were identified. A technology was considered different if it has a different energy source/fuel, feedstock, installation size (micro, small, large), investment climate at the time of the investment decision²¹ or other features.²² Eventually, if the share of plants using similar technology as in the project activity in all plants with the same capacity as the project activity is greater than 20% and if the absolute number of projects using a similar technology is larger than three, then the project activity is considered common practice.

In revising the Guidelines on Common Practice in September 2012, the rules and definitions were further clarified. It is now mandatory to provide a justification for using a geographical area smaller than the entire host country (e.g. province, region). The reference to extending the geographical area was removed from the guidelines. The exclusion of CDM activities was broadened to include registered projects, those requesting registration and those at validation. Furthermore, several definitions and the step-wise approach were better explained (without change in substance). Minor changes to the common practice analysis were made in subsequent versions of the additionality tool.

The definition of different technologies in the first-of-its-kind approach corresponds to the common practice analysis, with the exception that investment climate at the time of the investment decision and other features are not included.

3.3.2. Assessment

The general strength of using market penetration approaches for assessing additionality is that they do not assess the motivation or intent of project developers, but provide a more objective approach to evaluating additionality, based on the extent to which the project activity is already being implemented in the host country or region (Schneider 2009).

The initial criticism of the lack of clear definitions of similar projects and essential distinctions for common practice was addressed by the introduction and further refinement of the common practice guidelines, which clearly outline steps to follow and provide a definition of terms for a common understanding between project developers. Especially, the introduction of a threshold for common practice (20% and at least three similar projects) constitutes a significant improvement since it requires a quantitative assessment against a clear threshold. Clarity about the rules related to common practice analysis has therefore improved considerably over time. Also, from the sampled projects, it can be concluded that the introduction of the common practice guidelines has generally led to more detailed and better structured PDDs.

²⁰ For other types of GHG reduction activities, the more general rules of the additionality tool continue to apply.

²¹ “Inter alia, access to technology, subsidies or other financial flows, promotional policies, legal regulations.”

²² Such as a difference in unit cost of output by at least 20%.

However, several unresolved issues still exist. In the following, different aspects of the common practice analysis and the first-of-its-kind approach are discussed and assessed. The assessment is based on an analysis of the common practice provisions and on the findings of an empirical evaluation of 30 representatively selected projects (i.e. the review of PDDs and validation reports) (Section 2.2).²³

When defining similar projects in the common practice tool, the applicable output range is defined as “+/-50% of the design output or capacity of the proposed project activity”. This definition does not always reflect the scales of a technology, between which meaningful technological differences occur. For instance, in the case of a power plant with a size of 400 MW, power plants between 200 MW and 600 MW would need to be considered in the analysis. However, there may be smaller (e.g. 100 MW) or larger (e.g. 800 MW) power plants which still feature similar technical, economic characteristics (e.g. efficiency), a similar regulatory environment, or which are used in a similar manner (e.g. provision of electricity to the public grid). At the same time, a small power plant (e.g. 5 MW), may be significantly different in terms of technology or use. Also, when several plants are grouped to form a project (e.g. wind farm consisting of several wind generators), an output of +/- 50% may be misleading. For instance, for a wind farm with 20 wind generators of 1 MW capacity, the output range would be 10 to 30 MW. However, a smaller wind farm with only 10 wind generators of 1 MW capacity has similar characteristics since the wind generator is identical. For wind power, the test may provide more meaningful results if there was no scale at all since wind parks are usually composed of different wind generators of the same size. However, small internal combustion engines may well differ, from a technological perspective, from a large combined cycle power plant. In conclusion, the definition in the common practice guidelines (+/- 50%) does not allow for a meaningful classification of scale for different technology types. This definition can therefore be considered arbitrary and may lead to the erroneous exclusion of similar plants from the analysis. In contrast to the common practice tool, the first-of-its-kind tool does not use an output range to define similar technologies. This approach seems more appropriate.

When identifying similar projects, the common practice tool excludes CDM projects (registered, submitted for registration or undergoing validation) from the analysis. In the empirical analysis, of the 30 sampled projects, only three identified similar non-CDM projects. All other projects only identified projects under the CDM. A commonly used rationale (i.e. used by 9 of the 30 projects) is that, because all other comparable facilities are either CDM projects or are awaiting registration as CDM projects, the proposed project would also be non-viable without the CDM (i.e. not common practice). However, it could be argued that the general viability of projects is assessed as part of the barriers and/or investment analyzes and should therefore not be used as a pre-emptive argument for excluding CDM projects from the common practice analysis. The exclusion of CDM projects from the common practice analysis is particularly problematic if most or all new facilities in a sector use the CDM. For example, if all new wind power plants in a country register under the CDM, wind power could never become common practice, even if it reached a market share of more than 50% and was highly economically attractive. In contrast to the common practice tool, the first-of-its-kind tool does not have provisions to exclude CDM projects, which suggests that all existing projects, including CDM projects, are considered.

²³ Of the 30 projects sampled for the evaluation of the common practice analysis, the majority stem from China (20 projects), followed by India (3), Egypt (2), Pakistan (2), Brazil (1), Nicaragua (1) and Israel (1). Ten projects were registered before 2010, eight in the 2010-2011 period and twelve after 2011. Technology types in the sample are wind power (17 projects), hydropower (5), industrial projects such as coal mine methane utilisation or waste heat recovery (3), waste projects such as landfill gas capture (4) and other renewable energies such as biomass (1). Most projects (28 of 30) are classified as large-scale. Although the sampled two small-scale projects are not required to conduct a common practice analysis, some information on common practice was given in the corresponding PDDs.

The common practice tool and the first-of-its-kind tool use the same definition of the geographical area, which should be the entire host country, unless justification can be provided for a smaller geographical area. In the common practice analysis sample, 24 of 30 projects limited the applicable geographical area to a specific area smaller than the host country (such as province, region, state, municipality, etc.). All sampled wind projects from China (11)²⁴ and from India (3) selected an area smaller than the host country as the applicable geographical area. The most commonly used justification in the corresponding PDDs for limiting the geographical area is that investment conditions, especially in terms of electricity tariffs, available resources and labour costs, differ from province to province, making provincial/state level comparison necessary.

At first sight, this appears to be plausible since China and India are large countries with regions/states being important players in infrastructure development. Notwithstanding this, the size of the country and the political structure may not be sufficient to justify the choice of the regional/state level. In China, a nationwide feed-in tariff for wind power generation was introduced in 2009, establishing four different tariff categories, ranging from 0.51 CNY/kWh (0.08 USD/kWh) to 0.61 CNY/kWh (0.10 USD/kWh), depending on the region's wind resources (International Renewable Energy Agency 2012). For projects in India, the Electricity Act of 2003 and the resulting new tariff regulations were cited as the cause of different investment climates in various states. In fact, for wind power, the tariff varies based on local wind resources. Four bands of wind power density in W/m² determine the level of the feed-in tariff (International Energy Agency 2012). This means that the feed-in tariff may differ even between project locations in the same province if these feature different wind conditions. Therefore, the fact that there are different feed-in tariffs between provinces alone does not explain fundamentally different investment conditions in the different regions, as claimed in many PDDs, but rather only accounts for locally different wind resources, while the general support scheme is national²⁵. Based on these considerations, the rationale used by many projects for limiting the geographical area to a level below the entire country seems questionable. It can also be problematic to consider only the host country as the geographical area. If no or only a very few plants providing the same service exist in the host country, market penetration approaches do not give reasonable results. For example, the first aluminium plant in a country would always automatically be deemed additional, even if it used a technology that is clearly business-as-usual.

While the introduction of the common practice guidelines aimed to address the criticism of a vague definition of what constitutes 'different' technologies, several concerns remain. The possibility of defining a technology "as being different if there is a difference with regard to energy source/fuel, feed stock, installation size (micro, small, large), investment climate at the time of the investment decision (including, "inter alia, access to technology, subsidies or other financial flows, promotional policies, legal regulations") or other features (such as difference in unit cost of output by at least 20%)" still allows for significant possibilities to claim that rather similar projects are very different. This allows for the project to be defined rather narrowly and other plants very broadly, so that the threshold of 20% is not reached. With regard to the installation size, the same issue as for the output range (above) applies. Also, the criterion 'energy source/fuel' may be misleading. For instance, if a country has been using light fuel oil as a basis for its power plants, a switch to natural gas constitutes a different fuel, but does not explain a significant difference since the same generation technology can be used for both fuels. The same holds true for different solid fuels. Finally, 'other features' is a very broad term allowing for arbitrary interpretations. For example, a difference in unit cost of output does not constitute a plausible difference per se²⁶. For instance, higher unit costs

²⁴ Also all other Chinese (non-wind) projects included in the sample use a sub-national geographical area with a similar rationale as that for wind projects.

²⁵ A differentiation of the feed-in tariff depending on local wind resources is common practice in other countries as well.

²⁶ Two sampled hydro projects used this rationale.

may be required for technical or other reasons and may be compensated for by higher yields²⁷. Also, according to this interpretation, a proposed CDM project with *lower* unit costs would be considered different from projects already implemented without CDM, even though it is more profitable than other projects. Although in some cases, 'differences' may be well justified (e.g. by explaining that the investment climate was significantly different due to a change from a state-controlled to a more private investment-oriented power market), overall, the review of arguments presented in the sampled PDDs indicate that the term 'different' allows for significant room for interpretation.

The threshold of 20% market diffusion in the common practice tool cannot be considered robust if applied to all technologies and sectors. The stringency of the 20% is highly dependent on the number of technologies in a sector. In a sector with only two technologies, both available technologies could easily exceed the threshold, whereas none of the technologies may ever reach the 20% threshold in sectors with many different technologies. For instance, in a country with several fuels and technologies available for power generation (e.g. natural gas, coal, wind, hydro, biomass, PV), a low market diffusion may still constitute common practice due to the abundance of options and due to the (potentially) limited potential of some technologies. For instance, hydro electricity generation may constitute only 5% of overall electricity generation. Nevertheless, hydropower could still be considered common practice due to the fact that hydro resources are limited and most of the resources have already been exploited. In contrast, in a sector in which there are only a few technologies (e.g. for a certain industrial process) a market diffusion of 20% may constitute a reasonable value for determining common practice. Also, even though a technology may not be considered common practice considering all existing plants in a sector (i.e. considering the market saturation), it may be common practice considering the recent trend (i.e. considering the market share in a certain year)²⁸. For instance, electricity generation from wind may constitute only a small share of the overall electricity generation in a country (e.g. 1%). However, capacity additions in recent years may constitute a significant share of overall new capacity built. In the former case, wind power would not be considered common practice, whereas in the latter, trend-oriented, perspective wind power would constitute common practice. This issue is especially relevant in the case of long-lived capital stock such as in the power sector (Kartha et al. 2005). Similarly, the provision that at least three plants with a similar technology must have been constructed to consider a project common practice may not be appropriate in all situations. For example, if only four plants exist in a country and three use the same technology, thus constituting a market share of 75%, the construction of a fifth plant with the same technology would still not be regarded as common practice. In conclusion, a one-fits-all value as threshold for market diffusion cannot be considered appropriate.

With regard to the quality of evidence used for the demonstration that a project is not common practice, almost all PDDs provided anecdotal evidence to support their claims. Commonly made statements are that there is no evidence to suggest that a similar project has been, is being or will be implemented in this area and that all other projects use CDM financing as well. To support these claims, publicly available external documents such as energy statistics were used in the majority of projects (20 of 30 projects). Yet, these public documents do not provide information about different investment climates in terms of labour costs, available resources and feed-in tariffs.

As regards the validation of common practice, in 21 of 30 sampled projects, the DOE reviewed documents such as the World Bank website or energy statistics. Other means of validation were conducting interviews with stakeholders such as personnel with knowledge of the project design and implementation, local residents and officials.²⁹ However, the DOEs did not evaluate claims

²⁷ E.g. higher units costs may be required for certain equipment for small hydro in a mountainous area, which may be compensated for by higher yields due to a higher head of water.

²⁸ See Kartha/Lazarus/LeFranc (2005) for a definition of market saturation vs. market share.

²⁹ There is no further information available in the PDDs on the content of the interviews with the stakeholders.

made in the PDDs about different investment climates. In nine cases, the DOE in its validation report just repeated the claims made by the PDD.

3.3.3. Summary of findings

Overall, clarity about the rules related to first-of-its-kind and common practice analysis have improved considerably over time. In addition, from the sampled projects it can be concluded that the introduction of the common practice guidelines has generally led to more detailed and better structured PDDs. However, several flaws remain:

- The definition of the output range in the common practice tool is arbitrary and not linked to actual differences in scale of technologies or use.
- The exclusion of CDM projects from the analysis is questionable in a market situation in which most projects are implemented as CDM projects and significant technological changes and cost reductions occur.
- The rationale for limiting the geographical area to a level below the entire country is questionable. In some instances, limiting the geographical area to the host country can be problematic.
- The definition of a project as 'different' in the current common practice guidelines is still too vague and corresponding rules still leave significant room for interpretation.
- The share of 20% market diffusion and absolute number of three similar projects, across all sectors, cannot be considered robust since the appropriateness of these values depends on the number of available technologies in the sector. Additionally, the result of the common practice analysis is highly sensitive to whether all plants of a sector are considered or whether the recent trend (new plants built) is considered. This is especially relevant for sectors with long-lived capital stock.
- Generally, evidence used for the common practice analysis was not adequate in the sampled projects since relevant information for the determination of common practice (e.g. on different investment climates, available resources or feed-in tariffs) was not provided in the PDDs. Also, the validation by DOEs was not adequate in the sampled projects since claims on investment climates were not evaluated and since in several cases the DOE only repeated the claims made by the project participants.

3.3.4. Recommendations for reform of CDM rules

In general, the first-of-its-kind approach and the common practice analysis can be considered more objective approaches than the barrier or investment analysis due to the fact that information on the sector as a whole is taken into account rather than specific information of a project only. It reduces the information asymmetry inherent in the investment and barrier analysis. In this regard, expanding the use of market penetration approaches could be a reasonable approach to assessing additionality more objectively. However, the presented analysis shows that the way in which first-of-its-kind and common practice are currently assessed needs to be reformed in order to provide a reasonable means of demonstrating additionality. In the following, several recommendations are made for the reform of the current rules.

We identified several issues with the approach of using the same generic approach in the context of rather different sectors or project types. We therefore recommend abandoning this 'one-size-fits-all' approach and introducing specific approaches for specific project types, which adequately reflect the circumstances of the sector, in particular with regard to the definition of what is considered

a different technology and the threshold used to define common practice. A practical means of implementing this is including specific guidance in each methodology.

- Due to the inherently vague concept of ‘different’ technologies, it is recommended that the common practice rules are revised in such a way that methodologies or overarching guidance provide clearer guidance on how to support the claim of a ‘different’ technology including the evidence required (including evidence to demonstrate credible differences in the investment climate). Corresponding provisions in the VVS should also be amended in such a way to provide more specific guidance on how DOEs should assess the claim of ‘essential distinctions’ for different projects types. With regard to the above-mentioned arbitrary definition of the applicable output range, it is recommended that the common practice guidelines are revised in such a way to provide general guidance on how meaningful differences according to scale can be identified for different technologies. More specific guidance on how to define a range of capacity/output should then be defined in the corresponding methodology. In the absence of any definition of capacity/output range in the methodologies, the whole spectrum of plants or activities (from very small to very large) should be covered by the analysis.
- With regard to the exclusion of CDM projects from the common practice analysis, the rules should be amended in such a way that all CDM projects are to be included in the analysis as a general rule, unless specified otherwise by the methodology. Methodologies could specify that CDM projects are excluded to a certain extent and then gradually introduce them in the analysis. This is especially relevant if all projects of a certain technology use the CDM. As Schneider (2009) points out “other CDM projects could be included in the common practice analysis after a certain period or after a specific number of CDM projects have been implemented”. Another criterion for inclusion of CDM could be their market penetration. (International Rivers 2011) suggest that “after 3 years of full operation, a CDM project should be included in the common practice analysis”. Furthermore, a “list of project types that are not eligible for the CDM because they are common practice” (ibid.) (negative list) could also be helpful in this regard.
- Due to our finding that the selection of an area below the host country level as the applicable geographical area is a questionable assumption, it is recommended that the rules be revised to define the appropriate geographical area in the context of the specific circumstances, such as the number of projects or installations in the host country. A level below the host country level should not be used.
- The threshold for common practice should be defined depending on the type of technology and sector. Corresponding guidance should be provided in the methodologies. In sectors with long-lived capital stock (e.g. power sector), the common practice analysis could consider two different perspectives: a) common practice in the sector (e.g. power sector) as a whole (market saturation) and b) common practice in more recent investments (market share) (i.e. similar to the operating and build margin approach for projects displacing electricity). If common practice is established according to at least one of these perspectives, the project should be considered common practice. Since data availability for determining market diffusion may not be sufficient in each country and in order to ensure consistency in determining market diffusion, efforts (e.g. multilateral) for collecting this data and for providing this information to project developers could be helpful. Several global datasets already exist (e.g. UNEP DTU 2014, statistics by the World Bank, sectoral statistics, Platts database on power plants or cement statistics by Cembureau), which could be used to estimate market diffusion in different countries in a consistent manner. An extensive discussion of

the usefulness of market penetration for establishing common practice for certain projects types is included in (Karthä et al. 2005).

Due to the fact that several DOEs repeated the claims made by the project participants without documenting the way in which they actually assessed the appropriateness of the claims, we recommend strengthening efforts to ensure that all DOEs effectively comply with the reporting requirements related to the common practice analysis outlined in the VVS. For this purpose, no change in rules has to be applied, but the accreditation system may need to be strengthened to ensure compliance of all DOEs with applicable CDM requirements.

Another option for improving the analysis of common practice is to consider the overall potential available in a country. For instance, a small share of hydro in overall electricity generation may, on the one hand, be due to barriers, risks or economic unfeasibility of hydro construction (hydro electricity generation would therefore not be common practice). On the other hand, the small share of electricity generation from hydro may be due to the very limited hydro potential in the country. Most of the (small) potential may already have been exploited. Any additional hydro capacity could then be considered common practice since it has been exploited before. However, this approach would bring about the problem of defining ways to establish the potential (e.g. technical vs. economic potential, etc.), and the practicalities and transaction costs of evaluating this for many different technologies.

Furthermore, the common practice analysis could “be the first step in the additionality tool rather than the last” (International Rivers 2011). This way, instead of using often vague arguments for establishing common practice *after* the investment analysis, project developers would need to discuss common practice explicitly at the beginning of the analysis.

3.4. Barrier analysis

3.4.1. Overview

Historically, barrier analysis has been used as an important alternative or complement to the investment analysis analyzed above in Section 3.2. The barrier analysis is used to demonstrate that a project faces barriers that impede the project’s implementation in the absence of the incentives from the CDM. It is applicable to both small- and large-scale CDM projects:

Small-scale projects

According to Attachment A to Appendix B to Annex II of 4/CMP.1 the following barriers may be considered for small-scale projects:

- **Investment barrier:** a financially more viable alternative to the project activity would have led to higher emissions; this includes “the application of investment comparison analysis using a relevant financial indicator, application of a benchmark analysis or a simple cost analysis”.³⁰ In essence, this barrier allows an investment analysis to be conducted, as described in Section 3.2, but without providing any guidance on how the investment analysis should be conducted. In practice, however, it appears that guidance for investment analysis for large-scale projects (e.g. justification of benchmark IRR or sensitivity analysis) is, in most cases, also applied to small-scale projects.
- **Access-to-finance barrier:** the project activity could not access appropriate capital without consideration of the CDM revenues;

³⁰ See “Non-binding best practice examples to demonstrate additionality for small-scale projects” (EB 35, Annex 34).

- **Technological barrier:** a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
- Barrier due to **prevailing practice:** prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
- **Other barriers** such as institutional barriers or limited information, managerial resources, organisational capacity, or capacity to absorb new technologies.

Large-scale projects

In large-scale projects, the barrier analysis is part of the additionality tool and the combined tool. It is applied in two steps:

1. Identify barriers that would prevent the implementation of the proposed CDM project activity. Here, the eligible barriers are similar to the barriers relevant for small-scale projects, with the following differences:
 - The ‘investment barrier’ of the small-scale guidance is, in the large-scale guidance, referred to as ‘investment analysis’ (Section 3.2); a separate option for demonstrating additionality besides ‘barrier analysis’;
 - The ‘access-to-finance barriers’ of the small-scale guidance is called ‘investment barriers’ in the large-scale guidance; and
 - ‘prevailing practice’ of the small-scale guidance is, in the large-scale guidance, usually a mandatory additional step termed ‘common practice analysis’ that is required but is not sufficient in itself to prove additionality.
2. Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity).

Another important requirement of the two tools is the following: “If the CDM does not alleviate the identified barriers that prevent the proposed project activity from occurring, then the project activity is not additional.”

If these steps are satisfied, the project is potentially additional (pending passing of the common practice analysis).

In late 2009 (EB50), the CDM EB adopted the “Guidelines for objective demonstration and assessment of barriers” with a view to improving the objectivity of the barrier analysis. The document provides guidance on the objective demonstration of different types of barriers. For instance, it requires that “barriers that can be mitigated by additional financial means can be quantified and represented as costs and should not be identified as a barrier for implementation of project while conducting the barrier analysis, but rather should be considered in the framework of investment analysis” (Guideline 4 in EB50 A13).

In addition, methodologies may – instead of using one of the tools – provide their own combination of steps from the tools.

3.4.2. Assessment

The concept of barriers preventing investments and mitigation activities is an important element of the research and discussion on technology diffusion and low carbon pathways. From this, it seems reasonable that the additionality test could also take barriers into account and not only be based on

investment analysis. However, the barrier analysis faces multiple challenges in practice that strongly limit its usefulness in the context of the CDM.

Objectivity in barrier analysis

In earlier phases of the CDM, the claim for barriers preventing the implementation of projects was often based on anecdotal evidence, and it was very difficult to provide objective proof of why a barrier is sufficient to “prevent the implementation” (Schneider 2009). In practice, the concept of barriers per se as proof for additionality is problematic, as all investment projects in all countries faces some sort of barriers to its implementation, be they financial, technical or other. In earlier CDM projects, it was sufficient for PDD consultants to state barriers without providing objective and verifiable evidence that they actually *prevent* the implementation of the project. This led to some market participants claiming that with good PDD consultants you could have any project registered based on barriers.

Guidance on objective barriers

In late 2009 (EB50), these problems with barrier analysis led to the adoption of the “Guidelines for objective demonstration and assessment of barriers” by the CDM EB (Section 3.4.1). With their requirement to monetize barriers, the guidelines aim to assess the role of barriers in preventing the implementation of projects in a more transparent way. The monetization of barriers and their inclusion in the investment analysis provide a framework that allows an objective balancing of higher barriers and associated costs with the need for higher revenues. This may be one of the reasons why investment analysis (with or without monetized barriers) has largely replaced the use of the barrier analysis without application of investment analysis in demonstrating additionality (see below).

How much alleviation is necessary to overcome a barrier?

Another weakness of the barrier analysis lies in the application of the requirement to demonstrate that the CDM “alleviates the identified barriers that prevent the proposed project activity from occurring”. The fulfilment of this requirement was not often (explicitly) provided in PDDs nor checked by DOEs. Moreover, the tools do not require that the degree of ‘alleviation’ should be at least comparable to the strengths of the barrier under consideration. To demonstrate the viability of the project with the CDM, one would need to make the case as to why, for example, €x of CER revenues are sufficient to alleviate the risk of damage to a wind farm due to severe sand storms.

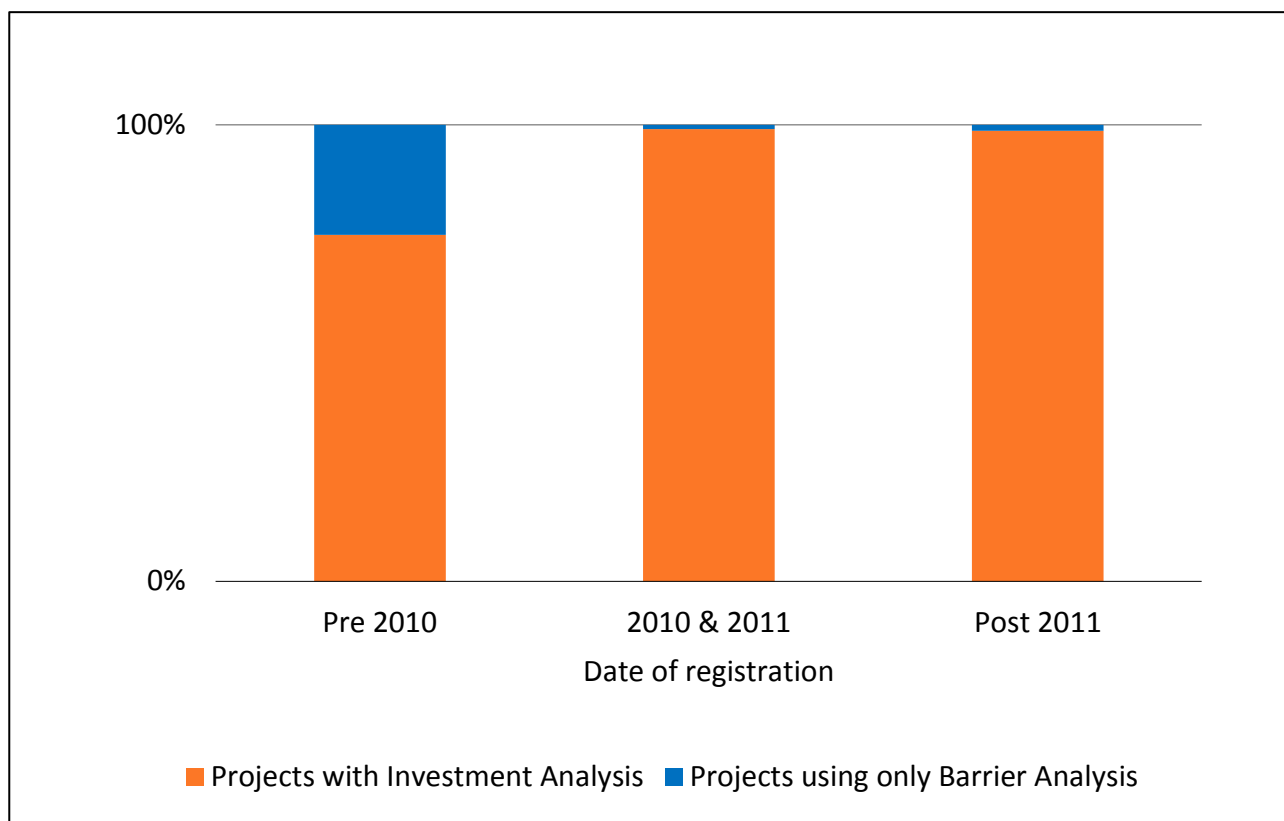
Also with regard to this requirement, the Guidelines provide greater specificity: “Demonstrate in an objective way how the CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by any of the barriers” (Guideline 2 in EB50 A13).

The vanishing role of barrier analysis in the CDM

The role of barrier analysis in demonstrating additionality in the CDM has been dramatically reduced from 2010 onwards (Figure 3-6). While in the period before 2010 approx. 24% of registered projects used the barrier analysis *without applying an investment analysis in parallel*, this share was reduced to approx. 1-2% of registered projects from 2010 onwards. Since then, the barrier analysis plays a certain role in reinforcing the additionality argument made in the investment analysis, but has largely lost its role as the main approach for demonstrating additionality.

This development might be explained by the introduction of the guidelines for objective demonstration and assessment of barriers.

Figure 3-6: Share of projects using the barrier analysis without applying the investment analysis in total projects



Notes: Own research based on a representative sample of PDDs from 30 stratified and randomly sampled projects that were labelled Investment Analysis option 'none' by the IGES (2014) database revealed that a certain percentage of these PDDs used an approach that in essence follows the Investment Analysis approach of the additionality tool, but was labelled 'Barrier Analysis'. The confusion in terminology was most prominent in small-scale project PDDs, which have the option to demonstrate 'financial barriers' which includes and is often an Investment Analysis. In the representative sample, the fraction of PDDs using actually an Investment Analysis while being labelled Investment Analysis option 'none' by IGES was 36.4% pre 2010 and 90% afterwards. The share of projects using Investment Analysis from the IGES database has, therefore, been increased by these shares from the sample analysis. Without this correction, the share of projects without investment analysis in the IGES database are 38%, 10% and 14%, respectively, for the three considered time periods of registration.

Sources: IGES 2014, authors' own PDD research

With the adoption of the guidelines, the barrier analysis has largely lost its role as the main argument for demonstrating additionality. After 2010, non-financial barriers are quoted in some projects, but merely as additional information to reinforce the main case for additionality, which tends to be based almost uniformly on investment analysis. Potentially, this development may have been supported by an improved performance of DOEs in validating barrier analysis in PDDs, due to an improved accreditation system.

3.4.3. Summary of findings

In early CDM projects, the routine use of anecdotal and often subjective evidence for claiming barriers has led to the registration of projects with questionable claims for additionality, which cannot be objectively assessed by DOEs. With the adoption of the Guidelines and possibly the improved performance of DOEs, the barrier analysis has largely lost its role as the main line of argument for demonstrating additionality. Rather, barriers are monetized and reflected in the investment analysis.

In the CDM, barrier analysis has lost importance as a stand-alone approach to demonstrating additionality because of the subjectivity of the approach. With the guideline, if barriers are claimed, they are monetized and integrated as costs in the investment analysis.

3.4.4. Recommendations for reform of CDM rules

Non-financial barriers can be important factors preventing the implementation of projects even though they may be profitable. Therefore, considering barriers in approaches for additionality determination is a valid approach.

However, the objective demonstration of barriers (as required in the Guidance) has turned out to be very difficult to operationalise without the reflection and monetization in an investment analysis.

Given the de facto non-application of the barrier analysis without investment analysis approaches in the current CDM practice, we recommend removing the barrier analysis from the additionality and combined tools. In return, key aspects of the Guideline related to the monetization of barriers³¹ may be included in the investment analysis step in the additionality and combined tools.

In order to demonstrate additionality of projects with high (non-financial) barriers that may not be monetized, a comprehensive ‘common practice’ analysis or in small-scale projects ‘prevailing practice’ analysis shall be carried out (Section 3.3). Here, objective data on market shares of technologies/project types may be collected that may serve as objective proxy information for the extent to which barriers actually prevent the implementation of projects.

On another note, the approval of “Guideline on objective demonstration and assessment of barriers” by the CDM EB may be seen as a positive example of how the CDM regulator, under the right conditions, can react to an obvious flaw in the rules and practice, and rectify the system.

3.5. Crediting period and their renewal

3.5.1. Overview

Project participants can choose between one crediting period of 10 years without renewal or a crediting period of seven years for their project, which is due for renewal every 7 years for a maximum of two renewals (a total of 21 years for normal CDM projects). (For afforestation and reforestation projects, the choice is between one period of 30 years and three periods of 20 years). The Marrakesh Accords state that for each renewal, a designated operational entity shall determine that “the original project baseline is still valid or has been updated taking account of new data where applicable”.

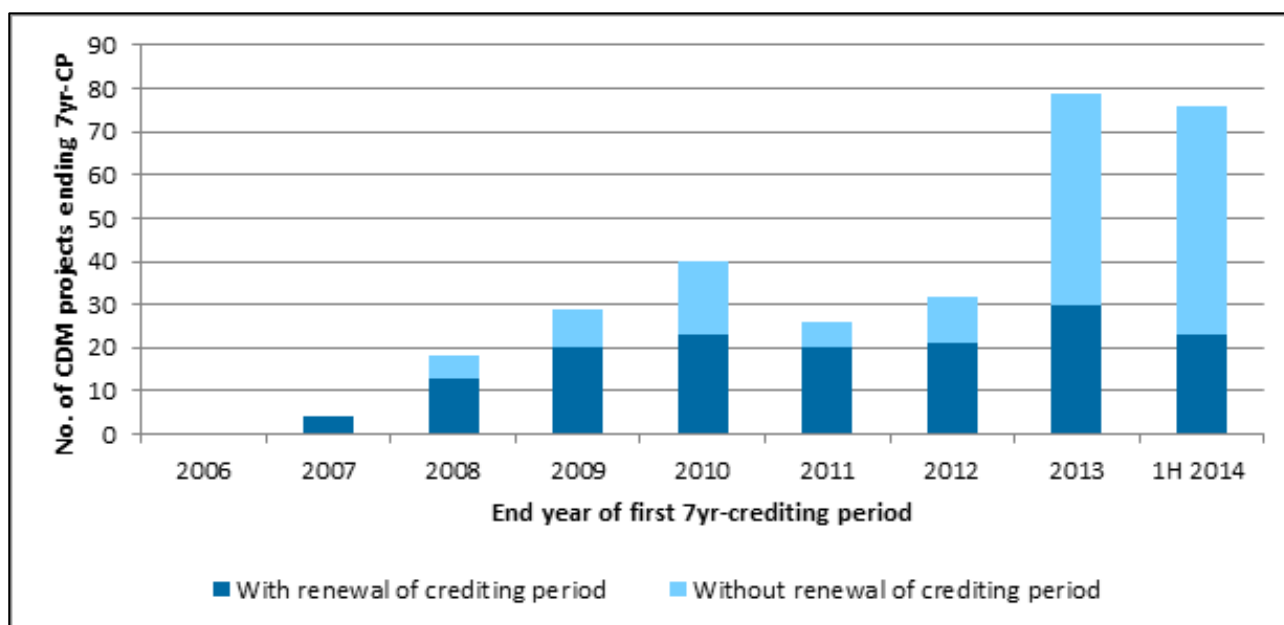
Requirements regarding the renewal of the crediting period were initially adopted in 2006 (EB28, Annex 40), subsequently revised several times (EB33, EB36, EB43, EB46, EB63, EB65, EB66), and partially incorporated in the project standard. At the renewal of crediting period, the latest valid version of a methodology must be used. If a methodology has been withdrawn or is no longer applicable, the project developers may use another methodology or request deviation from an applicable methodology. The CDM EB interpreted the ‘validity test’ in the Marrakech Accords in such a way that neither additionality nor the baseline scenario needs to be reassessed during the renewal of the crediting period. “The demonstration of the validity of the original baseline or its update does not require a reassessment of the baseline scenario, but rather an assessment of the emissions which would have resulted from that scenario” (Project Standard, Version 07.0, paragraph 289). The current rules mainly require an assessment of the regulatory framework, an assessment of

³¹ This relates to Guidelines no. 4 and 5 of EB50 Annex 13 that may be integrated as cost items related to barriers/risks in the investment analysis of the additionality and combined tool. Guideline 2 may also be implemented in the context of the investment analysis in the tools, in that the CER revenues should be sufficient to overcome the financial gap in project finance that is due to the barrier.

circumstances, an assessment of the remaining lifetime of technical equipment to be used in the baseline, and an update of data and parameters, such as emission factors.

Figure 3-7 plots the number of projects that have chosen a 7-year crediting period and that end their first crediting period in a given year and are therefore potentially entering a process of crediting period renewal. The increase in project registrations with the maturing of the CDM market from 2005 is mirrored by a steep increase in candidate projects for renewal seven years later, after 2012. The graph also indicates that the fraction of these candidate projects that actually underwent renewal significantly declines after 2012: While before 2012 roughly two thirds of all candidate projects underwent renewal on average, the rate dropped to roughly one third after 2012. This may be explained by the collapse in pricing and the petering out of the classical CDM market in 2011-2012, whereby CER prices below marginal transaction costs make renewal of crediting economically non-viable for most projects that do not benefit from long-term futures contracts with higher prices.

Figure 3-7: Number of CDM projects ending first seven-year-crediting period – with and without renewals



Sources: UNFCCC 2014, authors' own analysis

3.5.2. Assessment

The requirements to use the latest approved version of a methodology is a very important rule to assure that changes in the methodological ruling are also implemented in CDM projects within a reasonable timeframe and therefore seem appropriate. At the same time, it provides some certainty for investors that rules regarding the calculation of emission reductions are not changed within their crediting period.

The CDM EB's decision to interpret the Marrakesh requirement of assessing that "the original project baseline is still valid" in such a way that that only baseline emissions must be updated but that neither additionality nor the baseline scenario needs to be re-assessed could constitute a major risk for the environmental integrity of some project types. In 2011, the Meth Panel highlighted cer-

tain issues with this approach in an Information note to the EB (MP51 Annex 21³²), but the rules were not changed in response. In the following, we briefly analyze two main issues:

- The case of the baseline scenario changing over the course of the crediting period in a way that is not captured by the baseline methodology;
- The case of limited 'lifetime' of a baseline scenario.

Baseline scenario changing over of the course of crediting periods

In a number of instances, a baseline scenario could change over time during crediting periods and deviate from the assumptions in the underlying methodology. One example is a CDM project consisting of the conversion of an existing open cycle power plant to a closed cycle system. Assuming that after the first crediting period, new and lower cost technologies for the conversion would become available that would make the project economically viable, the implementation of the project activity after the first crediting period might be the most probable baseline scenario in the absence of the CDM. We are not referring here to the concept of dynamic baselines, e.g. the fact that baseline emissions are calculated based on the project output (e.g. in tons of steel or MWh per year). Rather, the scenario is changing, i.e. this refers to projects (or another low carbon activity) which, in the absence of the CDM project, would have been implemented at a later date due to changing circumstances.

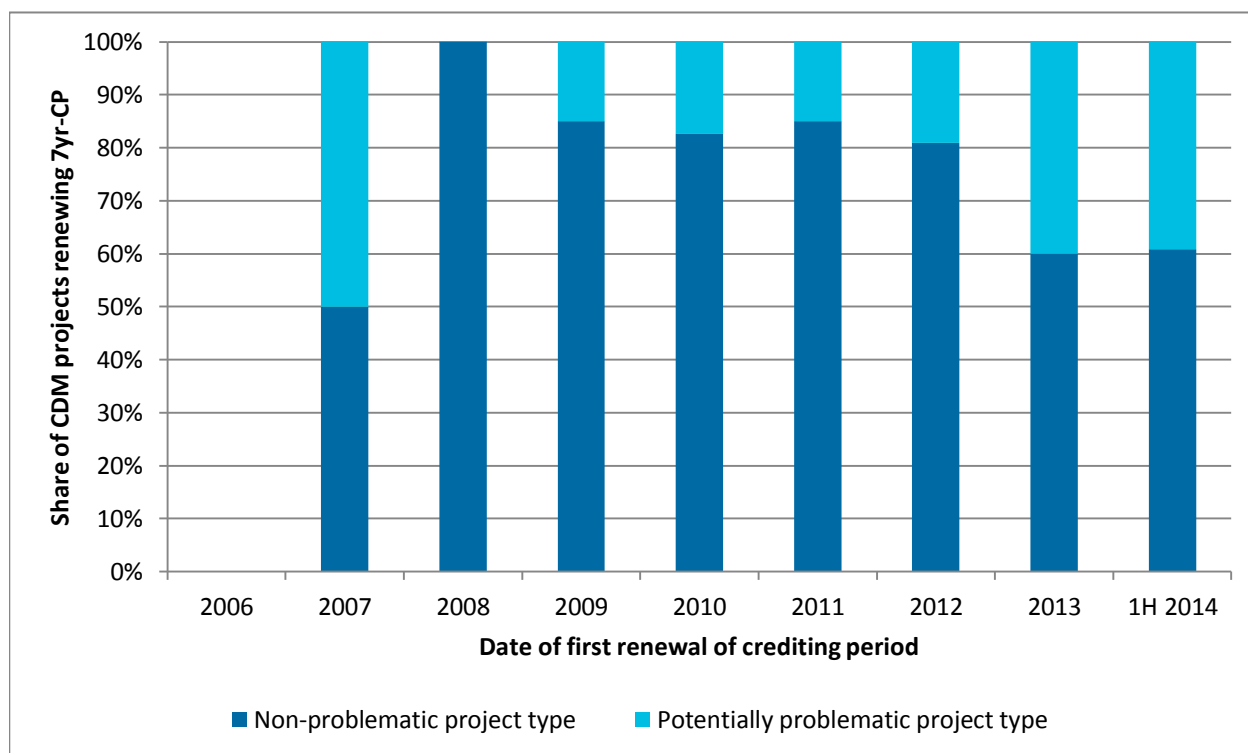
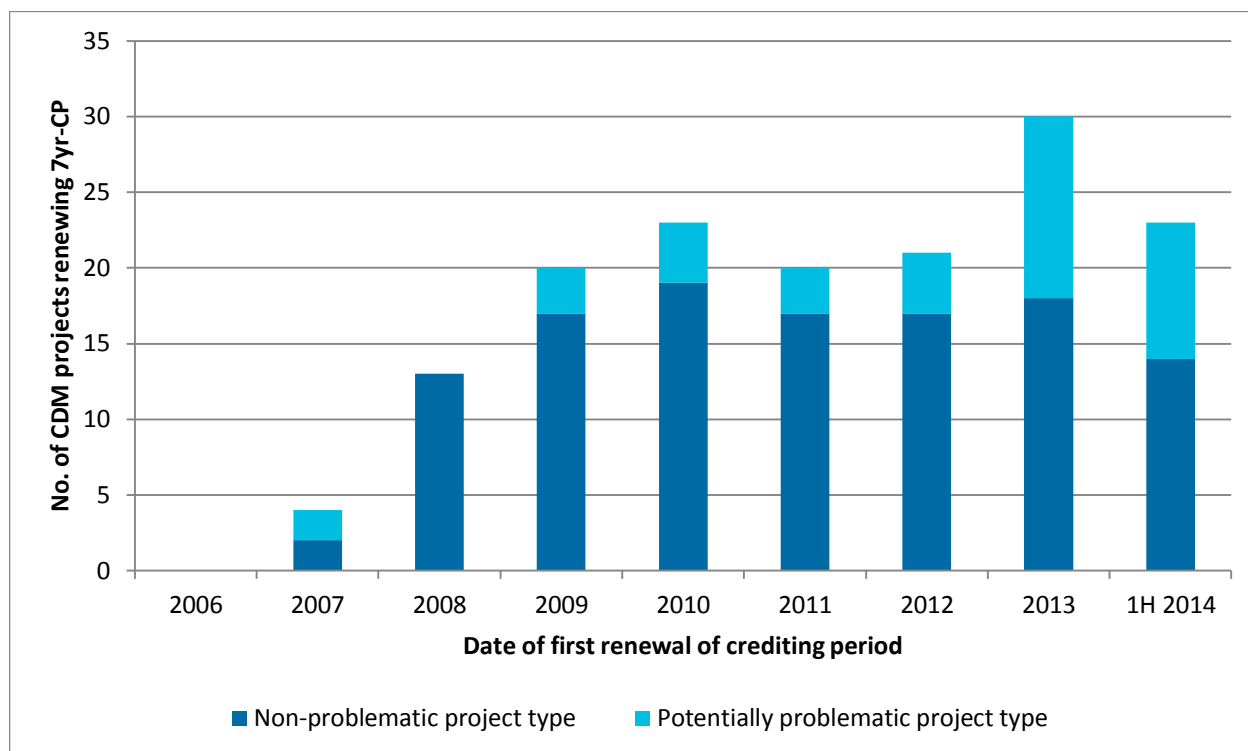
However, it is important to note that not all CDM project types are prone to changing baseline scenarios. Baseline scenarios typically change over time if they are the 'continuation of the current practice'. In such cases, changes such as retrofits could also be implemented at a later stage. In contrast, baseline scenarios do not change over time when they include a significant investment at project start in an alternative that provides similar services. This is the case if, for example, an industry can choose to fulfil their heat demand by either a new biomass boiler (project activity) or a new coal boiler (baseline). If one assumes that the project participant carries out a significant investment at the beginning of the baseline (e.g. to build the new coal boiler), it may be assumed that this investment is used until the end of its operational lifetime; replacing the coal boiler by a biomass boiler after seven years is economically not viable in general.

However, because CDM requirements explicitly rule out the re-assessment of the baseline scenario, cases with a change in baseline scenario cannot be taken into account, which leads to potential over-crediting in the second and third crediting periods in the case that the activity would have been implemented after the first crediting period due to changing circumstances.

Practical examples of such changing circumstances and related potential over-crediting can be found in Purdon (2014) for the co-generation sector. The paper provides an overview of how a change in external influence factors (e.g. sugar price) can influence the additionality and how a baseline scenario that is kept constant over several crediting periods can result in over-crediting.

³² https://cdm.unfccc.int/Panels/meth/meeting/11/051/mp51_an21.pdf.

Figure 3-8: Share of CDM projects renewing their seven year crediting period that is deemed non-problematic



Notes: Potentially non-problematic project types have been selected according to the criteria of having a lower risk of changes in the baseline scenario over several crediting periods.

Sources: UNFCCC 2014, authors' own analysis

Assessment of the scale of the issue

In the following, we make a very rough assessment of the scale of this issue. As mentioned above, not all project types are in danger of undergoing changes in baseline scenarios that are not foreseen in the underlying methodology. In order to arrive at a preliminary estimate of the scale of the potential issue, a list of 'potentially problematic' project types was identified that have a higher risk of changes in the baseline scenario over several crediting periods than those categorised as 'unproblematic'.³³

Please note that 'potentially problematic' does not mean that all projects in that project type have issues with the renewal of the crediting period, it simply means that the projects are in a sub-type that may contain potentially problematic projects. Figure 3-8 depicts the number of projects of a non-problematic project type in the total number of projects that actually underwent renewal of the 7-year crediting period in a given year.

The graph indicates that the number of projects renewing their crediting periods increased in 2007-2009. Until 2012, non-problematic projects made up the large majority of renewals. However, from 2013 the share of non-problematic projects dropped to approx. 60% of renewed projects. With such a low share, the issue may become more important in the future with a further increase in renewals (although the increase may be somewhat muted by the unfavourable market conditions).

In this context, it is important to note that CDM projects do not need to renew immediately, but may wait until market conditions are more favourable. Given the high number of projects that may undergo renewal at a later point in time combined with the lowering in the share of non-problematic project types may lead to considerable over-crediting.

Lifetime of baseline scenario

Another, also related, issue is that in more complex and very dynamic systems, such as the transport sector, the determination of a counterfactual baseline scenario is exposed to fundamental limitations in the ability to predict future developments. These limitations can lead to very high uncertainties in the baseline determination. In some instances even after a very few years, the actual baseline emissions could be significantly higher (or lower) than the calculated baseline emissions. For example, while it may be relatively certain that a project proponent choosing in the baseline situation to build a coal-fired boiler will continue to operate this boiler over its lifetime to meet its heat demand, the development of a city's transport system in the absence of a specific urban rail project could be very difficult and uncertain to predict: over some years one may assume that an increase in transport demand is catered for by increased use of private cars; however, street capacities may be limited and the municipalities may have to find solutions to their transport problems anyway, also in the absence of a specific project activity.

It therefore might be considered that for some project types in complex and dynamic environments, such as transport systems, the baseline scenario cannot be reasonably extended over a period of

³³ For a preliminary screening, the following projects sub-types (according to the classification of UNEP DTU) have been classified as "potentially problematic", i.e. it cannot be ruled out that the projects would be implemented later in time without the CDM under changing circumstances (please note that the sub-types may also contain projects which clearly do not have an issue): Adipic acid, Aerobic treatment of waste water, Agricultural residues: mustard crop, Air conditioning, Appliances, Biodiesel from waste oil, Biogas from MSW, Bus Rapid Transit, Cable cars, Caprolactam, Carbon black gas, EE industry – Cement, Cement heat, Charcoal production, EE industry - Chemicals, EE own generation - Chemicals heat, Clinker replacement, CMM & Ventilation Air Methane, CO₂ recycling, Coal Mine Methane, Coal to natural gas, Coke oven gas, Combustion of MSW, Composting, Domestic manure, EE public buildings, Existing dam, Food, Glass, Glass heat, HFC134a, HFC23, Industrial waste, Iron & steel, Landfill composting, Landfill aeration, Landfill flaring, Landfill power, Lighting, Machinery, Manure, Mode shift - road to rail, Natural gas pipelines, Nitric acid, EE industry - Non-ferrous metals, EE own generation - Non-ferrous metals heat, Non-hydrocarbon mining, Oil and gas processing flaring, Oil field flaring reduction, Oil to natural gas, EE industry – Paper, EE industry – Petrochemicals, PFCs, Power plant rehabilitation, Rail: regenerative braking, Solar water heating, Stoves, EE industry – Textiles, Ventilation Air Methane, Waste water. All other project types are deemed "non-problematic".

ten years and a renewal of crediting periods should not be allowed, given the risks of inadequate and very uncertain baseline scenarios for later time periods.

It was for this reason that the crediting period was initially limited to a single crediting period for some project types, including:

- PFC emissions from manufacturing in the semi-conductor industry (e.g. AM0092). This is an industry in which manufacturing technologies and composition of materials etc. change frequently compared to the duration of a 7-year crediting period
- Power saving from efficient management of data centers. Technologies and operating systems also typically have short lifespans compared to a 7-year crediting period.
- Complex transport systems such as the introduction of Bus Rapid Transport (BRT) systems in cities. In this context, the uncertainty in the baseline scenario and the resulting baseline emissions grows very rapidly, because development of transport systems over 5-10 years is difficult to predict with accuracy.

For these project types, the maximum crediting period has been set to 10 years in earlier versions of the methodology, because the uncertainty in the baseline scenario after 10 years did not allow for an objective determination of the emission reduction.

This limit in the crediting period to 10 years also allowed the methodology to be simplified, as the projection of baseline emissions over a limited period allows for simpler approaches and requires less monitoring provisions, thus reducing transaction costs.

Subsequently, however, the CDM EB took the decision (EB67, Para 107) that for each project type and methodology multiple crediting periods can be used (independent of any methodological limitations and uncertainty issues for the baseline setting as discussed above). This decision has been taken based on para 49 of the Modalities and Procedures for the CDM (decision 3/CMP.1, annex) that mentions alternative approaches. The paragraph was interpreted in such a way that both options shall be allowed in *each and every* methodology.

Since then, the relevant methodologies have been revised, allowing crediting for up to 21 years for all methodologies, without providing for further safeguards that would reduce the uncertainty in baseline scenario projection and potential over-crediting.

The issue of renewal of crediting period and more generally the updating of baseline scenarios is further discussed in Schneider et al. (2014).

3.5.3. Summary of findings

When the crediting period of a CDM project is to be renewed, the Marrakesh Accords require that the DOE check the validity of the original project baseline. A subsequent EB ruling (EB 43, Annex 13, paragraph 3) limited this check to an assessment of the regulatory framework, an assessment of the remaining lifetime of technical equipment that would be used in the baseline and an update of data and parameters, such as emission factors. The EB clarified that the validity of the baseline scenario should not be re-assessed.

With CDM project types for which the baseline scenario does not require a significant investment at the beginning of the crediting period (that would determine the baseline technology over the lifetime) this may lead to potential over-crediting. A preliminary analysis of projects that underwent renewal of the crediting period in recent years reveals that from 2013 onwards the share of potentially problematic project types (that might have issues of changing baseline scenarios leading to

over-crediting) increases to approx. 40% of projects with renewal. It is therefore recommended that this issue is resolved.

A subsequent ruling by the EB to remove the limit in the crediting period that some project types had in their methodology in sectors especially prone to baseline uncertainty over one crediting period (e.g. semi-conductor manufacturing, information technology, transport) further exacerbated the issue.

3.5.4. Recommendations for reform of CDM rules

We recommend two reforms to the current rules:

- Reassessing the baseline scenario at the renewal of the crediting period: The issue of potential over-crediting arising from inadequate checking of the validity of the baseline at the renewal of the crediting period could be addressed by expanding the assessment to the validity of the baseline scenario for CDM projects that are potentially problematic in this regard. For this, clear criteria for problematic project types should be formulated and guidance should be provided on how to test the validity of baseline scenarios for specific CDM methodologies.
- Limitation of the overall length of crediting for specific project types: Project types in sectors or systems that are highly dynamic and complex, and in which the determination of baselines is notoriously difficult (e.g. urban transport systems) should be limited to a single 10 year CDM crediting period or should be supported by other (non-crediting) finance sources.
- A further step that may be considered is a general limitation of projects to one 7 years crediting period. This may also build on the observation that when discounting future streams of CER revenue beyond 7 (or 10) years at typical hurdle rates longer crediting periods do not really matter for the NPV calculation. Longer crediting periods would only be allowed for project types that require a continuous stream of CER revenues to continue operation such as landfill gas utilization/flaring etc.

3.6. Additionality of PoAs

The advent of CDM Programmes of Activities (PoA) in 2007, and the subsequent refinement of related additionality approaches, changed the nature of additionality testing for many project types. Additionality assessment for PoAs is simplified compared to the requirements for the registration of individual projects. Project developers can establish eligibility criteria to assess additionality, including eligibility criteria, which identify project types that may be automatically additional. More importantly, because the thresholds for identifying small-scale and microscale activities with simplified additionality procedures are set at the level of the Component Project Activity (CPA) and not the level of the PoA, the overall PoA could be far larger than these thresholds. For example, the registered PoA “Installation of Solar Home Systems in Bangladesh” (Ref. 2765) has so far installed 123 MW of solar power and has estimated emissions reductions of 569,000 tCO₂ per year, or almost ten times the small-scale CDM threshold.

In the period of 2013 to 2020, PoAs potentially could supply 0.16 billion CERs. However, as discussed in Section 2.3, the eventual volume for these PoAs could be many times this amount.

3.6.1. Assessment

There are three principle issues with the demonstration of additionality in PoAs: specific additionality concerns about the technology areas covered by PoAs, the robustness of eligibility criteria to check additionality, and the use of small and microscale thresholds for PoAs that are much larger

in total than these thresholds. The first point is largely addressed in Chapter 4, because it is related to the mitigation technologies used in PoAs. As shown in Table 2-2, the majority of PoAs are in technology areas that are analyzed in this report (e.g. efficient cook stoves, efficient lighting, wind, hydropower, biomass), so these chapters should be consulted for an assessment of those technologies.

The second point concerns eligibility criteria, namely that the PoA rules require that the project participants develop a set of eligibility criteria that should guide the inclusion of CPAs. The criteria should be constructed so that, for each new CPA, simply confirming that the CPA meets the criteria is enough to ensure that the CPA is additional. These criteria should be based on approaches used in the relevant methodology or other additionality approach that is relevant for the PoA. In other words, there is not a detailed additionality assessment for each CPA in the way that project activities submitted for registration are evaluated. Instead, the eligibility criteria in the registered PoA design document (PoA-DD) should ensure that the CPA meets the relevant additionality test. For example, if part of demonstrating additionality in the relevant methodology is proving that the project is a particular scale or uses a particular technology, then the scale and technology specification would be listed as eligibility criteria against which each new CPA was checked. A possible concern could be that, if the project participants proposed eligibility criteria in the PoA-DD that did not fully capture the additionality requirements of the underlying methodology, there would be a risk that future CPAs could be included even if they were not additional. Although there was some confusion during the early days of PoAs on how to formulate eligibility criteria, this has not been the case since late 2011 when the EB published a standard for eligibility criteria. This was later replaced by the standard for “Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities” (CDM-EB65-A03-STAN, version 3.0). This standard provides not only the full list of issues that must be covered in the eligibility criteria, but also clear rules on how additionality may be assessed for PoAs.

The third point is perhaps the most important – whether allowing PoAs that are, in total, much larger than the size thresholds for small and microscale projects could increase the risks of non-additionality among PoAs. The small-scale CDM thresholds are 15 MW for renewable energy, 60 GWh savings for energy efficiency, and 60,000 tCO₂ per year emissions reductions for other project types with approved small-scale methodologies. The scale limits for the microscale additionality rules are 5 MW for renewable energy, 20 GWh savings for energy efficiency projects, and 20,000 tCO₂ for other project types, and are then combined with other criteria (described in detail in Chapter 4, e.g. country type, size of individual units, or even designation by a national authority), to qualify as automatically additional. However, the EB decided at their 86th meeting that microscale technologies using unit size as the basis of automatic additionality (i.e. independent units of < 1500 kW for renewables, < 600 MWh for energy efficiency and < 600 tCO₂ for other projects, all serving households and communities) would have no limit of the total scale of the project or CPA. In other words, an efficient cook stove project activity or CPA could have total emission reductions of greater than 20, or even 60, ktCO₂ per year.

Projects (in this case, CPAs) that qualify as small-scale CDM (SSC) then have access to the technology-based ‘positive list’ in the tool for “Demonstration of additionality of small-scale project activities” (Tool21, version 10.0). CPAs below the micro-scale thresholds would all be automatically additional as long as they meet both the scale and other requirements (e.g. technology, location, etc.). For small-scale CDM, the list of technologies considered automatically additional includes the following:

- Certain technologies whether grid-connected or off-grid: solar (PV and thermal), off-shore wind, marine (wave and tidal), and building-integrated wind turbines or household rooftop wind turbines up to 100 kW;

- Additional off-grid technologies below the SSC thresholds: micro/pico-hydro (with power plant size up to 100 kW), micro/pico-wind turbine (up to 100 kW), PV-wind hybrid (up to 100 kW), geothermal (up to 200 kW), biomass gasification/biogas (up to 100 kW);
- Technologies with isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds;
- Rural electrification projects using renewable energy in countries with rural electrification rates less than 20%.

Both microscale additionality and the small-scale CDM positive list approaches have been used extensively by PoAs. As shown in Table 3-2, 33% of the CPAs in registered PoAs, representing 27% of expected CERs, have applied the microscale or small-scale positive list approaches ('first of its kind' is discussed in Chapter 4). An analysis by the UNFCCC Secretariat³⁴ also shows that 142 of the 282 registered PoAs use microscale or small-scale rules for automatic additionality, with 65% of PoAs targeting households utilising one of these tools (Table 3-3). Many of these PoAs have already exceeded the microscale and small-scale thresholds at an aggregate level, as allowed in the CDM PoA rules. In contrast, the 120 CDM project activities that have used small-scale positive lists or microscale guidelines comprise only 0.8% of projects and 0.1% of expected emissions reductions (UNEP DTU 2015a).

Table 3-2: Use of automatic additionality approaches in CPAs within registered PoAs

Approach for automatic additionality	Annual CERs (ktCO ₂ /yr)	CPAs	CERs	CPAs
Microscale tool: country, unit size or DNA selection	3,520	188	11%	23%
Microscale tool: SUZ	60	9	0%	0%
SSC positive list	5,078	91	16%	10%
None	21,279	551	70%	65%
Total	29,936	839	100%	100%

Notes: A more recent version of the PoA pipeline was used here because of a revision of how the use of automatic additionality is classified.

Sources: UNEP DTU 2015b

³⁴ "Concept note: Thresholds for microscale activities under programmes of activities" (CDM-EB85-AA-A09)

Table 3-3: Technology and end-user types in registered PoAs that applied microscale and/or small-scale positive list criteria

Technology type	PoAs	Share of this type of PoA
End use type: Households	92	65%
Household biogas digesters	13	
Energy efficiency - household	2	
Energy-efficient lighting (LED and CFL)	28	
Improved cookstoves	36	
Solar water heaters	7	
Water purifiers	5	
Renewable-based rural electrification	1	
End use type: Others	50	35%
Energy efficiency – industrial	2	
Fuel switch	3	
Grid/off-grid connected renewable energy technologies (e.g. wind, solar PV, geothermal)	35	
Waste treatment (e.g. Wastewater, animal waste)	10	
Total	142	100%

Sources: Concept note: Thresholds for microscale activities under programmes of activities (CDM-EB85-AA-A09)

Whether granting automatic additionality to PoAs that are over the small and microscale thresholds poses a risk for additionality testing depends on the *reason* for the positive list designations. One of the main issues raised by the positive list is the *unit size* of the technology, with the argument being that the unit size on its own may be sufficient to identify a project type with a high likelihood of additionality (in combination with the other microscale criteria, where relevant). On this basis, the EB recently agreed that the size criterion for the microscale additionality tool should be *only* unit size, and not total project size.³⁵ This means that even a PoA using a large-scale methodology and have a total size beyond the SSC thresholds can still apply microscale additionality guidelines, as long as the unit size and other criteria are met.

The SCC positive list sets unit size limits for most categories of eligibility, although not for rural electrification or the grid-connected technologies (other than the 15 MW limit). The microscale guidelines also include the option of using a unit size less than 1% of the SSC threshold as a justification for applying these guidelines even if the projects are not located in Least Developed Countries (LDCs) or Special Underdeveloped Zone (SUZs).

The most important categories of PoAs (in terms of their contribution to expected CERs) utilising these tools are improved cook stoves, energy efficient lighting, biogas and small unit size solar power³⁶. For the first three technologies, the unit size is inherently small, so the size of the total project or PoA should not, by itself, determine the viability of the technology (bearing in mind, however, that overhead programme costs are obviously lower per unit for larger programmes). The additionality issues with improved cook stoves and energy efficient lighting are reviewed in Sections 4.12 and 4.13, respectively. These sections raise important questions about the additionality

³⁵ The changes to the Tools for “Demonstration of additionality of small-scale activities” (version 22) and “Demonstration of additionality of microscale project activities” (version 07) were approved at EB86 (October 2015), as were changes in the Project Standard, Project Cycle Procedure, and standard on standard on “Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities.”

³⁶ Although the table from the UNFCCC Secretariat refers to “Grid/off-grid connected renewable energy technologies (e.g. wind, solar PV, geothermal)”, our analysis has not identified any wind or geothermal PoAs using the small-scale positive list or the microscale guidelines.

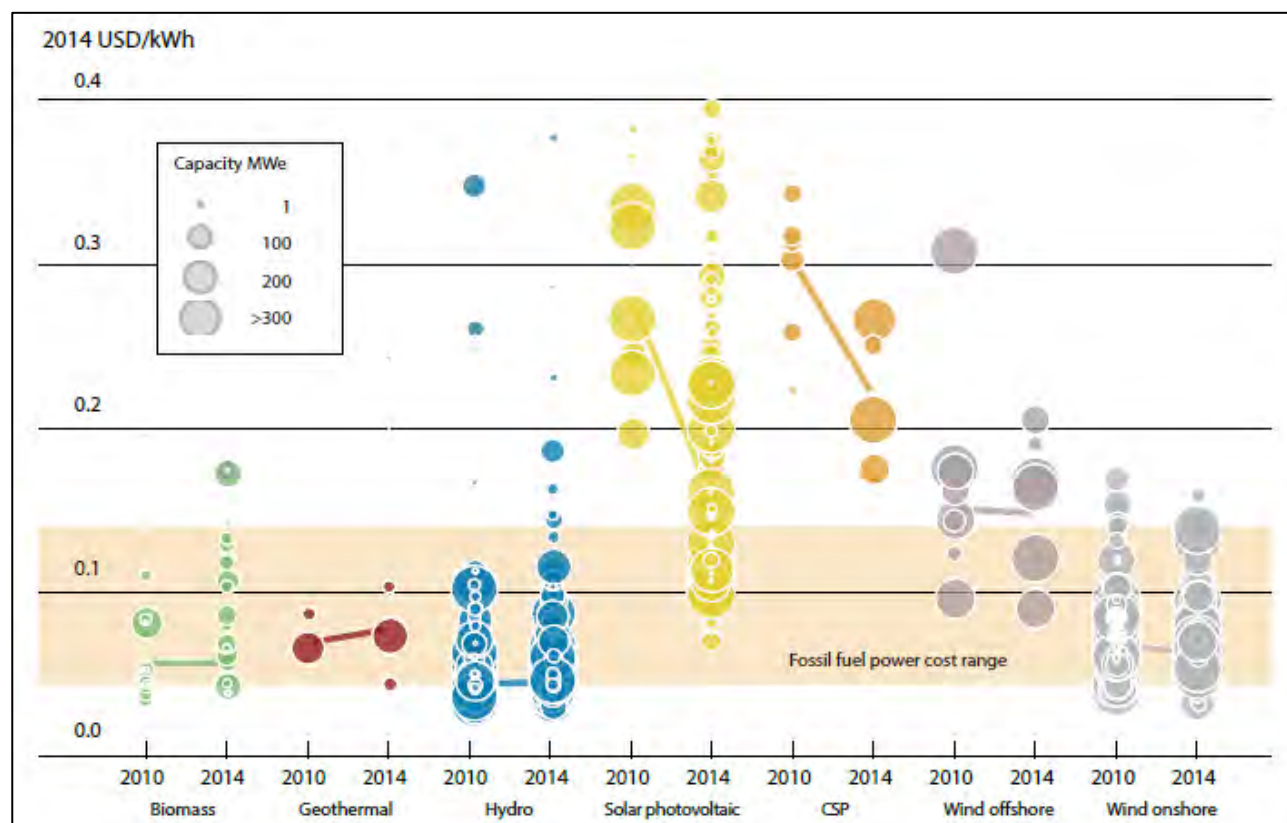
of these project types, despite their small unit size, particularly because of the role of other support programmes in promoting these technologies and possible over-crediting for cook stoves, for example. On the other hand, the extensive literature on household energy access technologies and carbon markets also points to numerous well documented barriers, and the high unit transaction costs associated with small unit size technologies (e.g. Gatti & Bryan 2013; IFC 2012; Warnecke et al. 2015, 2013). In addition, the analysis from the UNFCCC Secretariat mentioned earlier also shows that the average unit size of PoAs using the small-scale and microscale positive lists is, in fact, far below even the microscale unit size of 1% of the SSC threshold (Table 3-4).

Table 3-4: Size of individual units in microscale and small-scale PoAs using positive lists

Unit size as % of SSC threshold	Type I (kW)	Type II (MWh)	Type III (tCO ₂)
1%	150	600	600
PoAs applying microscale criteria			
Average – 0.022%	3.3	13.3	13.2
Std deviation – 0.054%	8.1	32.4	32.4
PoAs applying small-scale criteria			
Average – 0.23%	34	136	137
Std deviation – 0.34%	51	204	204

Sources: Concept note: Thresholds for microscale activities under programmes of activities (CDM-EB85-AA-A09)

For renewable power technologies, even if the total capacity of a PoA was over 15 MW, the unit size could not be larger than 5 MW for most technologies (15 MW for solar PV or solar thermal) to qualify for automatic additionality. Given the economies of scale in renewable energy power generation (Prysm 2012), small unit sizes would be expected to have higher capital costs, and would therefore be more likely to face investment barriers than larger scale plants. Project-level analysis by the International Renewable Energy Agency (IRENA) also suggests that smaller renewable energy plants not only have higher costs (i.e. because the smaller dots, representing smaller scale projects, are generally higher up in the figure), but that for solar PV and solar thermal these costs are still considerably higher than for fossil fuels (Figure 3-9). Analysis by EPRI has also shown that solar power at the several MW scale is considerably more expensive than conventional alternatives (EPRI 2012). This suggests that a solar PV (grid connected or off-grid) programme of any total size would not be economically viable if the units were below the small-scale thresholds. However, the challenge with solar technologies is that they are so expensive that carbon revenue is unlikely to close the financial viability gap, so they may be more driven by national policies than carbon markets (Section 3.7).

Figure 3-9: Levelized cost of electricity from renewable technologies, 2010 and 2014


Notes: Size of the diameter of the circle represents the size of the project. The centre of each circle is the value for the cost of each project on the Y axis. The LCOE of a given technology is the ratio of lifetime costs to lifetime electricity generation, both of which are discounted back to a common year using a discount rate that reflects the average cost of capital.

Sources: IRENA (2015)

On the basis of the unit size analysis shown in Table 3-4, the Secretariat prepared a concept note with recommendations to the EB using on unit size, and not total project or CPA size, as the basis for determining microscale additionality (CDM-EB85-AA-A09). The EB agreed to begin to implement an approach of using only a unit size threshold to determine if the size of the project qualifies for microscale (EB85 report, paragraph 42). The other requirements for microscale (e.g. location in an LDC or SUZ, if the unit size is greater than 1% of the SSC threshold) would remain unchanged. This means that the CPAs comprised of technologies that were below the unit size threshold would not be limited in their total size. For example, a CFL PoA in an LDC could have a CPA with 100,000 MWh savings and still apply the microscale additionality guidelines.

3.6.2. Summary of findings

While the PoA rules do allow programmes with a total size greater than the small-scale and microscale thresholds to utilise the automatic additionality provisions for these scales of projects, there is no evidence that this increases the risk of non-additional projects on its own (i.e. the share of projects that could be non-additional). In other words, the PoA rules do not fundamentally change the additionality risks for a given category of project technologies. The PoA process could, of course, increase the overall *scale* of the risk because they were designed to facilitate the large scale dissemination of small, distributed technologies. For example, there are 40 registered 'improved stove' project activities with expected CERs of 1 million tCO₂ per year, but there are 46 registered 'improved stove' PoAs that already have expected CERs of 8.1 million tCO₂ per year.

3.6.3. Recommendations for reform of CDM rules

Reform of the CDM rules related to additionality for particular project types and positive lists will address any concerns about additionality of PoAs.

3.7. Positive lists

The concept of ‘positive lists’ means that specific project types are considered automatically additional. Positive lists are one option to reduce transaction costs and increase the certainty of the CDM system from the perspective of project developers. Similar to standardized baselines, creating a positive list requires an upfront evaluation of technologies and their economic and regulatory environment, independent of the assessment of a particular CDM project proposal, to establish certain objective criteria that, if met, will result in a high likelihood of additionality. Once a positive list is established, a specific CDM project only needs to show that the pre-defined criteria are met, and does not have to apply other tools to justify additionality.

3.7.1. Positive lists in the CDM and impact on CER supply

Positive lists were introduced in the CDM through various routes. As briefly mentioned in Section 3.6, the CDM EB adopted the “Guidelines for demonstrating additionality of micro-scale project activities” in 2010, which were subsequently converted to a methodological tool, which first established automatic additionality for certain project types regardless of the type of methodology used (i.e. small-scale or large scale). Table 3-5 shows the technologies covered under version 7 of that tool, and the criteria they must meet in order to be deemed automatically additional. In addition to total project size (or, in the case of PoAs, the size of an individual CPA), the technologies must meet a further criterion such as location, unit size and/or consumer group.

Table 3-5: Projects considered automatically additional under the tool “Demonstration of additionality of microscale project activities”

1	Based on country (LDCs, SIDSs) <ul style="list-style-type: none"> Renewable energy up to 5 MW Energy efficiency up to 20 GWh savings per year Other small-scale CDM projects (Type III) up to 20 ktCO₂ emissions reductions per year
2	Based on unit size and consumer (households, communities, SMEs) (i.e. any country) <ul style="list-style-type: none"> Renewable energy of any size as long as unit size is less than 1500 kW Energy efficiency of any size as long as unit savings are less than 600 MWh per year Other small-scale CDM projects (Type III) of any size as long as unit savings are less than 600 tCO₂ per year
3	Based on host country designation of special underdeveloped zone (SUZ) <ul style="list-style-type: none"> Renewable energy up to 5 MW Energy efficiency up to 20 GWh savings per year Other small-scale CDM projects (Type III) up to 20 ktCO₂ emissions reductions per year
4	Based on designation of a technology by the host country <ul style="list-style-type: none"> Grid connected renewable energy specified by DNA, up to 5 MW, which comprises less than 3% of total grid connected capacity
5	Based on other technical criteria <ul style="list-style-type: none"> Off-grid renewable energy up to 5 MW supplying households/communities (less than 12 hours grid availability per 24 hours is also considered ‘off-grid’)

Notes: LDCs = Least Developed Countries, SIDSs = Small Island Developing States, SME = Small and micro enterprises, DNA = Designated National Authority.

Sources: Tool for “Demonstration of additionality for microscale activities”

In 2011, the “Guidelines on the demonstration of additionality of small scale project activities”, which later were similarly converted to a methodological tool, also included for the first time a list of technologies that would be considered automatically additional for any project meeting the small-scale CDM thresholds. This initially only included a list of grid and off-grid renewable energy technologies (i.e. the first two blocks in Table 3-6), but was expanded in 2012 to include small isolated units serving communities and renewable energy-based rural electrification.

Table 3-6: Technologies considered automatically additional under the tool “Demonstration of additionality of small-scale project activities”

6	Renewable energy (up to 15 MW, grid or off-grid, all end users) <ul style="list-style-type: none"> • Solar PV and solar-thermal electricity generation • Offshore wind • Marine technologies (e.g. wave and tidal) • Building integrated wind turbines or household roof top wind turbines (unit size \leq 100 kW)
7	Renewable energy (up to 15 MW, off-grid only) <ul style="list-style-type: none"> • Micro/pico-hydro (unit size \leq 100 kW) • Micro/pico-wind turbine (unit size \leq 100 kW) • PV-wind hybrid (unit size \leq 100 kW) • Geothermal (unit size \leq 200 kW) • Biomass gasification/biogas (unit size \leq 100 kW)
8	Distributed technologies for households/communities/SMEs (off-grid only) <ul style="list-style-type: none"> • Aggregate size up to SSC threshold (15 MW, 60 GWh or 60 ktCO₂ emission reductions) with unit size \leq 5 per cent of SSC thresholds (i.e. \leq 750 kW, \leq 3 GWh/y or 3 ktCO₂e/y)
9	Rural electrification using renewable energy <ul style="list-style-type: none"> • In countries with rural electrification rates less than 20%

Notes: Numbers in left hand column continue from previous table.

Sources: Tool for “Demonstration of additionality of small-scale activities” (version 10.0)

In addition to these tools, which apply across many methodologies, some individual methodologies have provided for automatic additionality for certain project types, often related to regulations. The most widely used is ACM0002 “Grid-connected electricity generation from renewable sources” (version 16.0), which was revised in November 2014 to include a two-part positive list for grid connected technologies. The first part is a list of technologies that are considered automatically additional: solar PV, solar thermal, offshore wind, marine wave and marine tidal (i.e. the technologies included in the first part of the small-scale CDM additionality tool, except at larger scale). The second part says that any technology with less than 2% of the total grid-connected capacity or less than 50 MW total capacity in the country is considered automatically additional. Since the revision of ACM0002, ten new project activities have requested and completed registration (no new PoAs have been registered). Of these, only one project has applied the new positive list provisions – a 141 MW solar PV facility in Chile. This is the largest solar facility to be granted automatic additionality.

Another important methodology with automatic additionality provisions includes ACM0001 “Consolidated baseline and monitoring methodology for landfill gas project activities” (version 15.0), which was revised in late 2013 to consider the following technologies automatically additional if, prior to the project activity, landfill gas was only vented and/or flared:

- electricity generation in one or several power plants with a total nameplate capacity that equals or is below 10 MW;
- heat generation for internal or external consumption;
- flaring (assuming no flaring prior to the project).

AM0113 “Distribution of compact fluorescent lamps (CFL) and light-emitting diode (LED) lamps to households” (version 01.0) provides for automatic additionality for any project distributing self-ballasted LED lamps to households. Projects distributing CFLs are only considered automatically additional if they are in a country with “no or only limited lighting efficiency regulations” reported by the UNEP en.lighten initiative’s Efficient Lighting Policy Status Map. AM0086 “Distribution of zero energy water purification systems for safe drinking water” (version 04.0) considers projects automatically additional if less than 60 percent of the population has access to improved drinking water sources or if the project proponents can demonstrate that more than half of the improved drinking water delivered does not actually meet the appropriate health standards. AMS-III.D “Methane recovery in animal manure management systems” (version 19.0) considers projects automatically additional when there is no regulation that requires the collection and destruction of methane from livestock manure. In addition to these, AM0001 “Decomposition of fluoroform (HFC-23) waste streams” (version 6.0), the first approved large-scale methodology, essentially uses a positive list approach based on regulation, because any project that does not face a regulatory requirement to abate HFC-23 emissions is considered additional. The same is true for ACM0019 “N₂O abatement from nitric acid production” (version 02.0).

While the positive lists presented above have not been used widely by CDM project activities (e.g. only 121 registered projects), PoAs have utilised the lists in the small-scale and microscale additionality tools (Table 3-2), with a third of CPAs in registered PoAs using these additionality approaches. Whether this growing group of PoAs presents concerns for the additionality depends on the strength of the justification for the original positive lists and for how long this justification is likely to be valid (i.e. how often the lists should be updated).

The criteria used to select the positive lists as well as the validity of these lists are presented in an information note prepared by the Small-scale Working Group in November 2014 called “Criteria for graduation and expansion of positive list of technologies under the small-scale CDM” (CDM-SSCWG46-A23). Table 3-7 summarises all of the positive list approaches, and shows the range of criteria used. The individual methodologies often refer to regulations to determine automatic additionality, or current penetration rates. The small-scale and microscale additionality tools use a mix of end-users, location, cost of service and penetration rates, depending on the specific technology group. This also highlights the similarity between positive lists discussed here and standardized baselines (Section 3.8), which also define a list of automatically additional technologies based on penetration rates and comparative costs.

Table 3-7: Criteria used for determining positive lists

		End-user	Regulation	Location	LCOS	Penetration	Capital cost
1	Microscale based on country (LDCs, SIDSs)						
	Renewable energy < 5 MW; Energy efficiency < 20 GWh; Other up to 20 ktCO ₂			x			
2	Microscale based on unit size and consumer (households, communities, SMEs) (i.e. any country)						
	Renewable energy < 5 MW and unit size <1500 kW; Energy efficiency < 20 GWh and unit savings < 600 MWh; Other < 20 ktCO ₂ with unit savings < 600 tCO ₂	x					x
3	Microscale based on host country designation of special underdeveloped zone (SUZ)						
	Renewable energy < 5 MW; Energy efficiency < 20 GWh; Other < 20 ktCO ₂			x			
4	Microscale based on designation of a technology by the host country						
	Grid connected renewable energy specified by DNA, up to 5 MW, < 3% of capacity					x	
5	Microscale based on other technical criteria						
	Off-grid renewables < 5 MW supplying households	x					
6	Small-scale renewable energy (up to 15 MW, grid or off-grid, all end users)						
	Solar PV and solar-thermal electricity generation; off-shore wind; marine (e.g. wave and tidal); building integrated wind turbines or household p wind =< 100 kW				x		
7	Small-scale renewable energy (up to 15 MW, off grid only)						
	Micro/pico-hydro (unit <= 100 kW); micro/pico-wind (unit <= 100 kW); PV-wind hybrid (unit <= 100 kW); geothermal (unit <= 200 kW); biomass gasification/biogas (unit <= 100 kW)						x
8	Small-scale off-grid distributed technologies for communities						
	Unit size =< 5 per cent of SSC thresholds	x					
9	Rural electrification using renewable energy						
	In countries with rural electrification rates less than 20%						
10	AM0086 water purification						
	<60% access to improved drinking water and <50% use of point-of-use zero energy water purification					x	
11	AM0113 energy efficient lighting						
	CFLs in countries with no or limited regulatory support All self-ballasted LED lamps		x			x	
12	ACM1 landfill gas utilisation						
	LFG for electricity or heat where vented or flared, or flaring where previously vented					x	x
13	AMS III.D methane and manure management						
	Biogas for power < 5 MW where no regulation requires collections and destruction of methane		x				
14	AMS III.C electric and hybrid vehicles						
	Market share of electric/hybrid vehicles < 5%					x	

Notes: LCOS = Levelized cost of service, LDCs = Least Developed Countries, SIDSs = Small Island Developing States, SMEs = Small and micro enterprises, DNA = Designated National Authority.

Sources: UNFCCC documents as cited in text

In terms of the duration of validity of the positive lists, the small-scale and microscale additionality tools did not originally include a time limit, although many of the methodologies specify a three-year duration of validity. The EB (EB81, paragraph 72) accepted a Small-Scale Working Group recommendation in late 2014 to set a three-year limit on validity for the small-scale CDM positive lists. In addition, the EB agreed on thresholds for 'levelized cost of service', 'penetration rate', and 'capital cost', as shown in Table 3-8. Note that these new rules only apply to the positive lists under the tool for "Demonstration of additionality of small-scale project activities", and not to microscale activities or any other positive lists.

Table 3-8: Graduation criteria for technologies under the tool for "Demonstration of additionality of small-scale project activities"

	End-user	LCOS	Penetration	Capital cost
Grid connected renewable electricity generation				
All renewable energy technologies in the current positive list		$\geq 50\%$ higher than all fossil fuels	Global average penetration $< 3\%$	
Off-grid renewable electricity generation				
All off-grid renewable technologies in the current positive list				≥ 3 times the cost of all fossil fuels
Distributed technologies for households/communities/SMEs				
All distributed technologies eligible under Type I/II/III and providing services of households/communities/SMEs	Assess appropriateness of user groups		Global average penetration rate $< 3\%$	≥ 3 times cost of all plausible baseline technologies

Sources: Information note "Criteria for graduation and expansion of positive list of technologies under the small-scale CDM" (CDM-SSCWG46-A23)

3.7.2. Assessment of current positive lists

The positive lists developed under the CDM to date are based on specific criteria such as penetration rate, costs, regulatory environment, and location. While these lists have not been used widely for automatic additionality among CDM project activities, their use among PoAs is widespread and growing. Some of the positive lists are now reviewed regularly, and have a clear basis for determining whether a technology should still be included in the lists. **This review of validity should also be extended to other project types, in particular those covered by the microscale additionality tool or approaches used in relevant methodologies (e.g. ACM0002).**

An important challenge with the current positive lists, however, is that the basis upon which they are established varies widely, without a clear rationale for the choice or level of the indicator (e.g. why penetration might be used for some technologies but levelized cost of service for others). **A consistent approach to determining technology eligibility is needed** to ensure that existing and new positive lists do not pose risks of non-additionality. The criteria and indicators used should have clear justification for how they influence project implementation. For example, while low market penetration or high capital costs could be strong indicators of prohibitive barriers for some technologies, it is not clear how the concept of 'special underdeveloped zones' (SUZ), which may

be defined differently by each DNA according to UNFCCC guidelines, is a reliable indicator of barriers.

As part of the justification of project types and technology choices, **positive lists must address the impact of national policies and measures to support low emissions technologies** (so-called, E- policies). As discussed in Section 3.9 and many of the sections within Chapter 4, national policies may be the primary driving factor for the implementation of certain technologies, rather than their underlying economics, market position or location. In fact, one of the criticisms of allowing renewable technologies to be considered automatically additional is that their costs are so high that carbon revenue alone cannot possibly make them financially viable, and so other incentives and policies are the real determining factor (Lazarus et al. 2012; Spalding-Fecher et al. 2012). This is even truer with smaller scale technologies. For example, in a study in Southern Africa, the levelized cost of roof-top solar PV was 20% more expensive than utility scale solar PV, while small hydropower was 70% more expensive than large scale (Miketa & Merven 2013). For positive lists to avoid the possibility of ‘false positives’ driven by national policies, some objective measure of renewable energy support may be needed as part of the evaluation process. An example of this would be the REN21 renewable energy global overview and interactive map,³⁷ which provides a comprehensive technology-specific database of the policies in place to support renewables. A positive list that included renewables could therefore be qualified by restricting its applicability to countries that did not have any support policies in place for that technology. Having support policies in place does *not*, on its own, mean that those technologies would not be additional, but only that there is a greater risk of this and so applying a positive list approach in that country would not be appropriate. Projects in those countries could still use the other tools available for demonstrating additionality for small- and large-scale projects – they would only not have access to automatic additionality based on the positive list. As an example, the positive list in the tool for “Demonstration of additionality of small-scale project activities” includes all solar PV and solar thermal technologies in all CDM-eligible countries. According to the REN21 policy database, however, the following countries have support policies³⁸ in place for solar PV: Algeria, Argentina, Brazil, Cape Verde, China, Côte d'Ivoire, Ecuador, Egypt, Gambia, Ghana, India, Jordan, Lebanon, Malaysia, Mauritius, Nepal, Nigeria, Republic of Korea, Senegal, Thailand, Uruguay, Uzbekistan, and Venezuela. For these countries, therefore, it might be more appropriate to require an analysis of barriers to solar PV rather than considering them automatically additional. This approach could be refined based on additional research into publicly available and up-to-date databases of renewable energy policies.

Finally, to maintain environmental integrity of the CDM overall, **positive lists should be accompanied by negative lists**. This is because the introduction of a positive list without any negative list could, by definition, only lower environmental integrity compared to the traditional approaches. Projects that do not fall within the positive list can still apply the traditional approaches. So, the positive list will lead to more ‘false negatives’ passing the test, but will not rule out any projects that are not additional. Overall, environmental integrity is thus lowered (albeit with the positive element of reducing transaction costs). An exception to this could be the few methodologies that deem projects as ineligible if they reach a market penetration threshold above a certain level, because they, in essence, include both a positive and negative list.

³⁷ The interactive map is shown at: <http://www.ren21.net/status-of-renewables/ren21-interactive-map/>. The full database of policies is available at <http://www.ren21.net/wp-content/uploads/2015/09/Downloadable-Consolidatedv1.2.1.xlsx>.

³⁸ Support policies may include, for example, feed-in tariffs, electric utility quota obligation, capital subsidies, tax credits, and net metering, but exclude renewable energy targets not accompanied by other incentives.

3.8. Standardized baselines

Project developers have repeatedly complained about the expensive and time-consuming process for formally registering a project under the CDM. The setting of the baseline for the greenhouse gas emission reductions associated with a project has required project developers to apply project specific methodologies in order to calculate baseline emission levels. The project developers take on significant costs before the approval of their project when collecting the data necessary to set the baseline and demonstrate additionality. In some cases the risks associated with these upfront costs may be too high for developers of smaller projects in poorer countries (Spalding-Fecher & Michaelowa 2013) – impacting the regional distribution of projects under the CDM. Apart from high transaction costs, the project-specific determination of baselines and assessment of additionality has been criticised in the past for being subjective (Schneider 2009). Due to the information asymmetry between project developers and DOEs subjective assumptions may be difficult to verify, which could result in non-additional projects or over-crediting, which both undermine the environmental integrity of the CDM.

The Cancun Agreements in 2010 provided for the use of *standardized baselines* in the CDM to address these limitations with the aim “to reduce transaction costs, enhance transparency, objectivity and predictability, facilitate access to the clean development mechanism, particularly with regard to under-represented project types and regions, and scale up the abatement of greenhouse gas emissions, while ensuring environmental integrity” (UNFCCC 2011c). In contrast to the project-by-project approach to setting baselines and demonstrating additionality, standardized baselines are established for a project type or sector in one or several CDM host countries. Standardized baselines can address any or all of three areas for standardization: demonstrating additionality, determining the baseline scenario or determining baseline emissions. In the latter case, standardization can include emission factors or individual parameters needed to calculate emission reductions.

Standardized baselines require host country approval and are submitted through the DNA of the host Party. They can cover one or several Parties. Once approved, project developers can use a standardized baseline when submitting a project for registration. In 2014, the EB further decided that it is up to the host Parties to decide whether projects must use an approved standardized baseline or whether they may alternatively use a project-specific approach, but noted that the EB could reject standardized baselines if this poses a risk to environmental integrity (CDM-EB78, para 24). In practice, all approved standardized baselines have so far been voluntary, except for a multi-country grid emission factor in the Southern African region.

The CDM allows standardized baselines to be derived either from suitable methodologies, from tools such as the ‘*Tool to calculate the emission factor for an electricity system*’³⁹ or from a generic framework that is applicable to all project types and sectors such as the ‘*Guidelines for the establishment of sector specific standardized baselines*’⁴⁰ adopted by the EB in 2011. Further regulatory documents include a procedure for submission of standardized baselines, a standard on the coverage and vintage of data, and guidelines for quality assurance and quality control.

The ‘*Guidelines for the establishment of sector specific standardized baselines*’ combine elements of market penetration, performance benchmarks, investment and barrier analysis. Under this framework, the standardized baseline results in a positive list of fuels, feedstocks and/or technologies for a given sector. The least emission-intensive fuel/feedstock/technology needed to produce

³⁹ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v2.pdf>.

⁴⁰ https://cdm.unfccc.int/filestorage/4/II/Y/4IY1RB7DMKLWPGF59XC3UE6JNH8Q2A/eb62_repan08.pdf?t=N2d8bnRoeHN3fDDSYyp3xU9Kx6IMk5Ho1yFw.

a certain percentage of the sector's output (i.e. defined by the CDM EB)⁴¹ is selected as the baseline fuel/feedstock/technology. All fuels/feedstocks/technologies that are associated with lower emission intensities than the baseline technology are candidates for inclusion in a positive list of fuels/feedstocks/technologies that are automatically deemed additional. The DNA of the host country also needs to demonstrate for each of the candidates for the positive list that they are either less economically attractive than the non-candidates or face barriers to entry (Schneider et al. 2012). The baseline technology is also used to determine the baseline against which emission reductions are calculated (Hermwille et al. 2013).

Table 3-9: Approaches for deriving grid emission factors

DNAs could use either the standardized baseline guidelines or the grid emission factor tool to determine the grid emission factor and submit the value as a standardized baseline. The weaknesses of this opportunity to choose between two alternative approaches are explained below:

- 1) **Pick and choose issue:** The two approaches will provide two different values for the grid emission factor. Thus, the DNA could pick and choose between two completely different methodological approaches for determining the grid emission factor. Countries for which the guidelines result in higher values will use that approach, whereas countries for which the tool results in higher values will use that approach. Overall, having two parallel approaches could undermine the environmental integrity compared to the current situation in which only one approach is available.
- 2) **Vintage of data issue:** The standardized baseline guidelines consider all plants, whether they were recently constructed or decades ago. This could result in a situation in which coal power is determined as the baseline fuel, even if no coal power plant has been constructed or been under construction for a decade. In contrast, the grid emission factor tool aims to consider recent developments by observing which plant types were recently added to the system or are under construction or which plants actually operate at the margin.
- 3) **'One size fits all' issue:** The grid emission factor tool uses a methodologically approach that considers the particularities of the electricity system, considering different possible effects of displacing grid electricity (marginal plants not being dispatched/the construction of other power plants avoided or delayed). In contrast, the guidelines do not consider the characteristics of the sector and make generalised assumptions, which have little meaning in the power sector. The guidelines therefore result in less accurate grid emission factors than the grid emission factor tool.

Sources: Own compilation

The environmental impact of standardized baselines will be affected by how stringently the standardized baseline is set for a given project type. The stringency of standardized baselines needs to safeguard the environmental integrity of the CDM whilst also striking the right balance between accuracy and transactions costs in order to ensure that there is an incentive for developing new CDM projects.

The implications of standardized baselines on environmental integrity will also vary depending upon the sector that they are applied to, as the approach relies considerably upon the assumption that the penetration of a fuel/feedstock/technology is negatively correlated with its cost and/or with barriers that impede their deployment (Hermwille et al. 2013). For certain sectors there will undoubtedly be a strong correlation, i.e. energy efficient lighting and efficient electrical appliances.

⁴¹ In its guidance, the EB has defined a preliminary additionality/crediting threshold of 80 % in priority sectors and 90% in other sectors.

However for other sectors, i.e. with multiple products or with strongly varying circumstances among installations, the correlation will be weaker or absent and alternative approaches for setting baselines and demonstrating additionality may be more suitable (Hermwille et al. 2013). Applying the current framework to sectors for which such a correlation is lacking could broaden the positive lists for technologies that are unlikely to be additional. In the power sector, for example, the guidelines do not reflect the particular features of an electricity system. The Methodologies Panel recommended that the EB limits the applicability of the SB standard to sectors other than the power sector (MP65, paragraph 38 and 39). In response, the EB requested the Methodologies Panel to assess the applicability of the proposed framework to different project types (EB81, paragraph 41). However, as of January 2016, the current guidelines are still applicable to all sectors. In 2015, a standardized baseline was finalized for consideration by the EB, which includes grid emission factors for different islands of Cape Verde and applies for some islands the “*Guidelines for the establishment of sector specific standardized baseline*” and for others the grid emission factor tool. The issues arising from the application of the guidelines to the power sector are highlighted in Table 3-9.

The following issues may pose further environmental risks through the implementation of standardized baselines in the future:

- **Mandatory versus voluntary use of standardized baselines:** The current CDM EB framework does not make the use of standardized baselines mandatory (CDM-EB74, para 24). It is the discretion of the DNA to decide whether project participants can select between project-specific or standardized baselines. In this regard, the DNA can make their use voluntary or mandatory. This may have two consequences:
 - Standardized baselines open an alternative route towards positive lists (Section 3.7), while keeping the approach of demonstrating additionality through the current means. By definition, this can only increase the number of false positives. Hence, the likelihood for additionality is lower, compared to a situation in which there would be no standardized baselines.
 - The voluntary use of standardized baselines could lead to project developers picking and choosing between baseline emission factors which could result in over-crediting (Table 3-9, bullet point 1). Indeed, Spalding-Fecher & Michaelowa (2013) argue that the CMP should make standardized baselines mandatory.

The degree of these risks depends on how conservative the standardized baselines are set. The more conservatively that they are set, the lower the risk is. An example of how picking and choosing between project-specific and standardized baselines can undermine environmental integrity is the approved standardized baseline ASB0018 for cook stove projects in Burundi. The approved standardized baseline provides default values for the amount of non-renewable biomass consumed in the baseline (1.5 tonnes per person and year for households in urban areas and 1.1 tonnes per person and year for households in rural areas). However, at the same time, a PoA (9634) is registered in Burundi with project-specific baseline values based on data from a more recent survey. The project-specific baseline is more ambitious (1.21 tonnes per person and year for households in urban areas and 0.83 tonnes per person and year for households in rural areas). Had the standardized baseline been approved prior to the registration of the project, the project could have opted for the less ambitious standardized baseline. At the same time, projects with higher project-specific baseline values could opt for their project-specific baseline and not use the standardized baseline.

- **Quality assurance and quality control (QA/QC) of standardized baselines:** Version 04.0 of the procedure ‘*Development, revision, clarification and update of standardized baselines*’

(CDM-EB84-A10) sets out how a project developer can submit a proposal for a standardized baseline to the CDM EB following first the approval of the relevant DNA. It is necessary for the project developer to provide a list of documents when submitting a standardized baseline proposal, which includes the Form F-CDM-PSB, supporting documents and an Assessment Report of QA/QC. The CDM EB clarified only in 2015 that DOEs not only need to verify whether the required documents were submitted and that the data were collected according to guidelines for quality assurance and quality control but that they also need to check that the standardized baseline has been calculated in accordance with the relevant standards (CDM-EB85-A10). However, this decision still needs to be adequately reflected in the latest version of the '*CDM validation and verification standard*' (CDM-EB82-A14). Moreover, stakeholders expressed concerns that if the requirements for QA/QC are too stringent, it may prevent the approval of standardized baselines from LDCs (Hermwille et al. 2013). Therefore, the QA/QC Assessment Report is currently not compulsory for countries with 10 or fewer registered CDM projects as of 31 December 2010 for the first 3 submissions (CDM-EB84-A10, Para. 18), even though countries can request financial support from the UNFCCC for the development of Assessment Reports. These exemptions from applying the QA/QC guidelines could undermine the environmental integrity of the CDM.

- **Development of country-specific thresholds:** CMP9 requested the EB *"to prioritise the development of top-down thresholds for baseline and additionality for the underrepresented countries in CDM"* (CDM-EB82-AA-A10, Para. 3). Many stakeholders regard the currently approved default thresholds for additionality and baseline as '*unattractive*' and '*not suitable*' for specific national/regional/sectoral circumstances (CDM-EB82-AA-A10). However, the adoption of country-specific thresholds could be a difficult process as such thresholds are a policy choice rather than a methodological choice. It is uncertain whether or not the development of country-specific thresholds would undermine the environmental integrity of the CDM. However, it would likely result in the incomparability of emission reductions from different standardized baselines within the same project type or technology.
- **Exclusion or inclusion of CDM facilities in the peer group to determine standardized baselines:** The development of certain standardized baselines relies upon the performance and actual output from the facilities of a sector of the host country. Some of these facilities may already have registered CDM projects (i.e. referred to as CDM facilities) that would have improved performance due to the incentives provided by the CDM. Given that it is difficult to determine the performance and outputs of these facilities in the absence of the CDM, it is necessary to take a decision on whether to include CDM facilities in the calculation of a standardized baseline or not. Exclusion of CDM facilities could undermine the environmental integrity of the CDM (CDM-EB78-AA-A05). As a default all CDM projects need to be included in the respective cohort unless the DNA can demonstrate that the cost of fuels/feedstocks/technologies exceed those of certain comparable projects (CDM-EB79, para 41).
- **Vintage of standardized baselines and static versus dynamic standardized baselines:** Standardized baselines are often constructed based on plants for which the investment decision was taken many years in the past. If a standardized baseline is static and not frequently updated, it can mean that additionality is established and baselines are determined based on a market situation that is ten or twenty years old (i.e. failing to take into account technological breakthroughs). This could result in significant crediting of BAU (Table 3-9, bullet point 2). The high-level CDM Policy Dialogue has therefore recommended that in order to drive technological change, the standardized baseline framework must ensure *"that the focus of incentives constantly shifts to the next generation of technologies"* (CDM Policy Dialogue 2012, p. 6). As a consequence, the current standardized baseline framework specified interim data vintages and

update frequencies of 3 years respectively (CDM-EB77-A05). For example, sectors associated with slow dynamic developments in the past may allow for a relaxation in the frequency of updates without compromising the environmental integrity of the CDM.

- **Level of disaggregation:** The level of disaggregation is an important factor to consider in the development of a standardized baseline, which can enable a DNA with limited resources to prioritise which mitigation measures to incentivise within a sector. For example, Hermwille et al. (2013) refer to a case study of the rice mill sector in Cambodia where only a small number of large scale rice mills account for approximately 60% of the total output. Given that the remaining output is provided by thousands of small-scale rice mills with very varied use of technologies that are associated with different emission intensities, it was necessary to disaggregate the standardized baseline on the basis of plant size (i.e. focus standardisation on the large-scale mills). The importance of disaggregation of standardized baselines is further demonstrated in the power sector. If a standardized baseline is based upon the entire power sector of a country, it is likely that the use of renewables and possibly of the most efficient fossil fuel technologies would be encouraged. However, if the standardized baseline was disaggregated further to consider fossil fuel consumption only – different mitigation options such as fossil fuel switching would be encouraged instead (Hermwille et al. 2013). The appropriate level of disaggregation depends very much on the project type and the actual circumstances. With the current approach, DNAs can determine the level of disaggregation, though there is no EB guidance on how the appropriate level can be determined. In addition, such guidance would hardly be compatible with the ‘one size fits all’ approach pursued in the standardized baseline guidance.

In light of all of these challenges, the implementation of standardized baselines may not be suitable for all sectors, project types or countries. The development of a standardized baseline can achieve the objective of simplification in certain sectors associated with more homogenous products. However, standardized baselines will be more difficult to apply to sectors associated with a range of products and strongly varied circumstances amongst installations. Therefore, it should be carefully checked for which purposes, sectors, project types and baseline emission sources standardized baselines are appropriate. Applying one single approach to establish standardized baselines for different sectors, project types and locations, as currently pursued under the CDM, is likely to undermine the environmental integrity of the CDM. Standardized baselines should be developed from actual projects and reflect the particular circumstances of the sector, project type and location. Once approved within a country or region, standardized baselines need to be mandatory for all new CDM projects to prevent that more CERs are issued as if the standardized baseline was not established (Schneider et al. 2012).

To ensure that the concept of standardized baselines provides what it was established for, particularly *“to reduce transaction costs, ... while ensuring environmental integrity”* (UNFCCC 2011c), the EB should review the standardized baseline framework. This review should ensure that

- stringent QA/QC procedures are applied to all standardized baselines,
- all CDM facilities without any exemptions are included in the peer group for the standardized baseline,
- DNAs can build their decision on the appropriate disaggregation level on a clear guidance document which aims to determine the level of disaggregation in a way that covers the mitigation activity of the standardized baseline as accurately as possible and includes as few external factors (‘noise’) as possible;
- the practice of using the same methodological approach to establish standardized baselines for all the different sectors, project types and locations is replaced by the development

of project-specific standards derived from actual projects and reflect the particular circumstances of the sector, project type and location, and last but not least,

- standardized baselines are mandatory for new projects once they are approved for a country.

If these improvements were introduced, standardized baselines could be a valuable tool to improve the environmental integrity of the CDM while lowering transaction costs.

3.9. Consideration of policies and regulations

The consideration of policies and regulations in demonstrating additionality and establishing emissions baseline has been a controversial issue for project-based mechanisms as the CDM. Policies and regulations adopted by the host country can have a significant impact upon future emission pathways. For example, the introduction of air quality regulations for power plants impacts their CO₂ emissions while fossil fuel subsidies reduce the viability of less emission-intensive technologies (Schneider et al. 2014). When setting the baseline and demonstrating additionality there have been concerns raised about both perverse incentives for policy makers (i.e. host countries not implementing policies and measures that reduce emissions so that they can secure greater carbon revenues) and about environmental integrity, by either over-crediting of emission reductions (i.e. inflating the baseline by excluding policies and measures that reduce emissions) or non-additional projects (i.e. registering projects that are economically viable and do not face barriers by allowing the exclusion of subsidies in the investment analysis).

The modalities and procedures for the CDM require that *"a baseline shall be established taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector"* (decision 3/CMP.1, para 45(e)). However, in order to avoid the creation of perverse incentives for policy makers, the CDM EB adopted, at its 22nd meeting, the following rules with regard to the consideration of policies in setting baselines:

- **E+ policies:** to not consider policies adopted after 1997 which *"give comparative advantages to more emissions intensive technologies or fuels over less emissions intensive technologies or fuels"* in setting the baseline;
- **E- policies:** to not consider policies adopted after 2001 which *"give comparative advantages to less emissions intensive technologies over more emissions intensive technologies"* in setting the baseline.⁴²

These rules failed, however, to fully address perverse incentives for policy makers, as host countries would continue to have incentives to maintain existing E+ policies such as fossil fuel subsidies. Furthermore, although host countries will not be discouraged from implementing national policies and measures that reduce emissions (E- policies), the rules are likely to result in over-crediting of emission reductions.

Overall, in the case of E- policies it seems difficult to reconcile the two policy objectives: avoiding perverse incentives for policy makers and ensuring environmental integrity. If E- policies were excluded when demonstrating additionality or setting baselines, perverse incentives would be addressed but environmental integrity would be undermined, since projects that are financially viable could claim they are not, and emissions baselines would be inflated. If E- policies were included, environmental integrity would be ensured but perverse incentives not addressed.

⁴² EB 22 report, Annex 3: Clarifications on the consideration of national and/or sectoral policies and circumstances in baseline Scenarios (Version 02), https://cdm.unfccc.int/EB/022/eb22_repan3.pdf.

In 2013, the EB reviewed its E- policy guidelines with a view to balancing these two conflicting policy objectives and *“agreed to pursue an approach by which, for the first seven years from the effective implementation date of the relevant E- policy, the benefit of that E- policy does not need to be considered by project participants in the additionality demonstration through investment analysis”* (CDM-EB73, para. 70). The approach would thus ignore new E- policies but for a limited time period. Initially allowing the exclusion of E- policies could be seen as addressing perverse incentives for policy makers, while ensuring environmental integrity in the longer term. It would also expand the approach of ignoring E- policies from baseline setting to demonstrating additionality. However, the EB has not yet been able to agree on a revision of its E+/- policy guidelines.

Based upon an econometric analysis, Lui (2014) raises questions about the decline of feed-in tariffs in China⁴³ that may imply a gaming to ensure wind projects are not economically attractive for the purpose of demonstrating additionality under the CDM. Schneider et al. (2014) argue that with regards to E- policies it is simply not feasible to achieve both a robust crediting baseline and avoid the creation of perverse incentives at the same time. Striking a balance between the two objectives is therefore required when setting the crediting baseline, which is likely to vary depending upon the sector, project type and type of policy.

Given the contrasting objectives, the decision on whether to include E- policies in the baseline or not and the determination of additionality of a project-based mitigation activity should depend upon the potential risk of either creating perverse incentives or over-crediting. Schneider et al. (2014) recommend that the following approach should be pursued when setting baselines and determining additionality:

- If the **risk of creating perverse incentives** is judged to be considerably larger than the risk of over-crediting, then E- policies should not be considered (for a certain period) in setting the baseline;
- If the **risk of over-crediting** is deemed to be considerably greater than the risk of creating perverse incentives, then E- policies should be considered in setting the baseline.

The extent to which the setting of baseline and determination of additionality for a project-based mitigation activity is more liable to either the risks of perverse incentives or over-crediting depends upon the wider co-benefits associated with a policy other than simply climate change mitigation. For example, the deployment of renewables is associated with multiple co-benefits such as employment opportunities, energy security and air quality improvements. Given the additional benefits associated with such E- policies, it is less likely that these policies would not be adopted as a consequence of changes to an international crediting mechanism. Schneider et al. (2014) and Spalding-Fecher (2013) therefore both argue that the risk of creating perverse incentives (i.e. delaying policies and regulations to secure more CER revenues) may be lower than the risks of setting a less robust baseline (i.e. by not including E- policies in the baseline) that leads to the over-crediting of emission reductions. Spalding-Fecher (2013) also points out that such co-benefits are likely to occur with electricity generation, energy efficiency and agriculture projects.

However, the risk of creating perverse incentives is likely to be greater from mitigation activities such as the capture of HFC-23, which reduce GHG emissions but do not lead to significant co-benefits. In such a case, preventing the creation of perverse incentives (i.e. host country delaying regulation on the capture of HFC-23) could be given priority over additionality and environmental integrity by not considering such E- policies when setting the baseline. Nevertheless, CERs resulting from such projects would be used to offset GHG emissions in other capped systems and, since

⁴³ Spalding-Fecher (2013) discusses the uncertainty within the CDM EB on how such a policy change should be classified under the E+/- policy guidance.

they are not truly additional, result in globally higher emissions. Therefore, it would be more appropriate to support such technologies by other means such as ODA or climate finance or by addressing these mitigation potentials as own contribution under the ADP negotiations.

From a more practical perspective, Spalding-Fecher (2013) emphasises the difficulty of accurately accounting for the effects of E- policies when setting either the baseline or demonstrating additionality. The level of difficulty depends upon the policy type. For example, the impact of direct financial incentives such as mandatory feed-in tariffs can be removed more easily from an emissions baseline than indirect sectoral incentives such as renewable energy portfolio standards or economy-wide policies such as domestic emissions trading schemes. Furthermore, defining the date of policy implementation and the effectiveness of enforcement may sometimes represent additional challenges (Spalding-Fecher 2013). If the guidance provided by the CDM EB – given the difficulty in isolating the impact of multiple (and sometimes conflicting) policies when setting emission baselines or demonstrating additionality – would only relate to direct financial incentives this could lead to the unequal treatment of host countries under the CDM based upon the types of policies implemented (Spalding-Fecher 2013). For example, it would be easier to determine the additionality of a renewable energy project in a host country with direct financial incentives such as feed-in tariffs compared to a host country that adopted a domestic emissions trading scheme. This practical problem could not only undermine the environmental integrity of the CDM but also mean that excluding E+ or E- policies may simply not be practical.

Taking into account the various challenges to strike the right balance between avoiding perverse incentives for policy makers and ensuring environmental integrity, Spalding-Fecher (2013) concludes that the risk of perverse incentives is not as high as previously assumed in many countries and sectors, while the risk of over-crediting is substantial. He therefore suggests that as a general rule all E- policies should be considered in both baseline-setting and additionality determination. Schneider et al. (2014) outline the following options in relation to E- policies:⁴⁴

- No consideration of E- policies: No perverse incentives would be created if both existing and planned E- policies were not considered when setting the crediting baseline. In fact, host countries would be encouraged to introduce further E- policies to further reduce emissions below the baseline. However, the disadvantage of this option would be that the emission baseline would most likely be inflated above BAU.
- Consideration of existing E- policies, exclusion of future E- policies: A more balanced approach could involve the introduction of a cut-off date for excluding future E- policies from being considered in the setting of the crediting baseline. However the setting of a cut-off date is problematic. For example, if the cut-off point is set too early it may inflate the crediting baseline by considering E- policies that have already been adopted. Nevertheless, the option provides a positive incentive for host countries to adopt new E- policies (after the cut-off point) to reduce emissions.
- Consideration of existing and future E- policies: A robust crediting baseline would be established if both existing and future E- policies were considered (either ex-ante or ex-post), however this would most likely create disincentives to introduce E- policies as their introduction could lower the potential for credits. In addition, this option would provide greater uncertainty for investors as to when a crediting baseline would be updated.

In order to prevent the over-crediting of emission reductions, it would be a sensible approach to include current E- policies in the crediting baseline. However, accounting for future E- policies is

⁴⁴ These options are outlined in the context of a sector based crediting mechanism though they also apply to the CDM.

more problematic and warrants further research to ensure that a reasonable balance is achieved between limiting the over-crediting of emission reductions and preventing the creation of perverse incentives. Schneider et al. (2014) and Spalding-Fecher (2013) conclude that the balance should be more in favour of limiting over-crediting in the CDM or future mechanisms as they judge this risk to be greater to undermining environment integrity than from the creation of perverse incentives. Therefore, as a general rule Schneider et al. (2014) recommend that adopted policies and regulations reducing GHG emissions should be included when setting crediting baselines and policies that increase GHG emissions should be discouraged by their exclusion from the crediting baseline where possible.

3.10. Suppressed demand

One of the challenges of applying GHG accounting approaches in poor communities is that the current consumption of many household services (e.g. heating and cooking energy, lighting and potable water) may not reflect the real demand for those services. This could be a result of lack of infrastructure, lack of natural resources or poverty, particularly the high costs of these services relative to household incomes. The situation of 'suppressed demand' creates a problem for setting baselines, because the CDM rules say that the baseline scenario selected for a project should provide the same level of service and quality as the project scenario (Gavaldão et al. 2012; Michaelowa et al. 2014; Spalding-Fecher 2015; Winkler & Thorne 2002). This is clearly not the case if the project scenario provides a much higher service level, owing to low historical consumption. At the same time, the CDM rules state that "the baseline may include a scenario in which future anthropogenic emissions by sources are projected to rise above current levels, due to the specific circumstances of the host Party" (UNFCCC 2006a para. 46). This section analyzes how the concept of suppressed demand has been implemented in CDM methodologies and what the potential impacts on CER issuance as a result of the revised and new methodologies. For a more detailed conceptual explanation of suppressed demand, as well as background on previous EB decisions and guidance, see Chapter 9 of Spalding-Fecher et al. (2012).

3.10.1. Treatment of suppressed demand in approved methodologies

Table 3-10 below shows the methodologies in which suppressed demand has been explicitly considered, in three different categories. The first group is from a work plan agreed by the EB at their 67th meeting, when the EB requested that the Secretariat and relevant support panels explore how to incorporate suppressed demand. The second group is methodology revisions for which the proponent of the revision motivated the change based on the Suppressed Demand guidance. The final group is new methodologies that were developed after the approvals of the Suppressed Demand guidance and incorporated those ideas, as documented in the UNFCCC Methodology Guidebook. Of the original 10 methodologies in the EB work plan, 5 were revised or replaced, while an additional 8 methodologies fall into the second and third categories.

Note that a group of methodologies not listed here, but that implicitly recognise suppressed demand, are those addressing new large-scale power generation or industrial development. New renewable energy, natural gas or high-efficiency coal power plants are not required to show that they actually replace an existing power plant. Given that most developing countries have shortages in power supply, building a new natural-gas-fired power plant, for example, could potentially increase emissions compared to current levels. However, the accepted principle on baseline development across the CDM is that the baseline is not necessarily the same as historical emissions, but should reflect the most likely development scenario for the sector. Even in countries with chronic power shortages, it would be difficult to argue that there would be *no* capacity increases under the baseline scenario. This means that, even in these cases, CDM projects – if properly justified –

would potentially displace another alternative new plant. The determination of the alternative plant is then the subject of the methodology's baseline scenario analysis.

Table 3-10: Methodologies explicitly addressing suppressed demand or part of EB work plan on suppressed demand

Meth No.	Meth Name	Re-vised?	When	Pipeline ¹⁾	
				Pro-jects	PoAs
From EB67 work plan List of Methodologies					
AM0025	Alternative waste treatment processes	ACM22	EB69	127	5
AM0046	Distribution of efficient light bulbs to households	No		2	0
AM0086	Installation of zero energy water purifier for safe drinking water application	No	EB70	1	0
AM0094	Distribution of biomass based stove and/or heater for house-hold or institution	No	EB70	0	0
ACM0014	Treatment of wastewater	Yes	EB77	47	1
ACM0016	Mass Rapid Transit Projects	No		16	1
AMS I.A	Electricity generation by the user	Yes	EB69	50	17
AMS I.E	Switch from non-renewable biomass for thermal applications by the user	Not nec-essary	EB70	24	58
AMS II.E	Energy efficiency and fuel switching measures for buildings	No		44	5
AMS III.AR	Substituting fossil fuel based lighting with LED/CFL lighting systems	Yes	EB68	4	14
Additional revisions referring to Suppressed Demand					
AM0091	Energy efficiency technologies and fuel switching in new and existing buildings	Yes	EB77	0	0
AMS II.G	Energy efficiency measures in thermal applications of non-renewable biomass	Yes	EB70	45	62
AMS III.F	Avoidance of methane emissions through composting	Yes	EB67	103	20
New methodologies where EB noted Suppressed Demand					
ACM0022	Alternative waste treatment processes	New	EB69	10	0
AMS II.R	Energy efficiency space heating measures for residential buildings	New	EB73	0	0
AMS I.L	Electrification of rural communities using renewable energy	New	EB66	0	1
AMS III.BB	Electrification of communities through grid extension or new mini-grids	New	EB67	0	0
AMS III.AV	Low greenhouse gas emitting safe drinking water production systems	New	EB60/62	0	10
Total with revisions or new related to suppressed demand				473	194
Total pipeline				11,990	446 ²⁾

Notes: ¹⁾ Pipeline is as of 1 January 2014. ²⁾ PoA DD's submitted, which may include multiple methodologies and include 23 PoAs replaced by new versions. Total number of methodology citations in all PoAs submitted is 874.

Sources: Authors' own compilation

While the proportion of project activities influenced by these methodologies is very small, a significant share of PoAs are utilising the revised or new methodologies. In terms of the quantitative impact of the revisions to methodologies to incorporate suppressed demand; however, this may only relate to projects or PoAs entering the pipeline after the revision. While project participants are allowed to update the version of the methodology that they use prior to the renewal of the crediting period, this should not make the emission reduction calculations less conservative. Given that the suppressed demand revisions could increase the baseline significantly, it is not entirely clear whether the EB would approve this revision for existing projects prior to the renewable of the crediting period (when the latest version of the methodology must be used). Because AM00025 was replaced by ACM0022 in order to address suppressed demand, none of the projects or PoAs under AM0025 (which was not used after October 2012) would be able to utilise the new suppressed

demand approach embodied in ACM0022. Table 3-11 below shows the number of PoAs and Projects in the pipeline both before and after the revisions.

Table 3-11: CDM pipeline affected by suppressed demand methodologies

Meth No.	Meth Name	Total pipeline		New pipeline since revision	
		Projects	PoAs	Projects	PoAs
Revised methodologies					
ACM0014	Treatment of wastewater	47	1	0	0
AMS I.A	Electricity generation by the user	50	17	0	13
AMS III.AR	Substituting fossil fuel based lighting with LED/CFL lighting systems	4	14	3	1
AM0091	Energy efficiency technologies and fuel switching in new and existing buildings	0	0	0	0
AMS II.G	Energy efficiency measures in thermal applications of non-renewable biomass	45	62	2	18
AMS III.F	Avoidance of methane emissions through composting	103	20	7	8
New methodologies that incorporate suppressed demand					
AMS I.E	Switch from non-renewable biomass for thermal applications by the user	24	58	24	58
ACM0022	Alternative waste treatment processes	10	0	10	0
AMS II.R	Energy efficiency space heating measures for residential buildings	0	0	0	0
AMS I.L	Electrification of rural communities using renewable energy	0	1	0	1
AMS III.BB	Electrification of communities through grid extension or construction of new mini-grids	0	0	0	0
AMS III.AV	Low greenhouse gas emitting safe drinking water production systems	0	10	0	10
Total		283	183	46	109

Sources: Authors' own compilation

How the suppressed demand concepts and guidance are implemented varies significantly by methodology. With the exception of AMS III.AR, all of the methodologies use the project activity level as the baseline activity level. Only AMS III.AR defines a quantitative Minimum Service Level that is used to calculate baseline emissions. AMS I.L and AMS III.BB define an MSL, but it is only used to adjust the emissions factor for the baseline, rather than to directly calculate baseline activity levels or emissions. For AMS III.F and ACM0022, the minimum service level is qualitatively defined as having a solid waste disposal site (i.e. rather than considering the quantity of waste processed per household). What the methodologies all do, however, is to define a baseline technology that may have higher emissions than the actual current technology. For example, households may currently only use candles and kerosene hurricane lamps, and therefore have very low lighting services, but the methodologies use a kerosene pressure lamps for the baseline technology, because this can deliver the MSL for lighting services.

For the revised methodologies, the resulting baselines emissions could be substantially higher per household (Annex 8.2, Table 8-1). For example, under ACM0014, baseline methane emissions may still be considered even if the wastewater is currently not treated or stored in a way that would necessarily produce emissions (e.g. lagoons with depth less than 1 m). ACM0022 and AMS III.F have emissions factors that could be double the current practices, while for AMS I.L and AMS

III.BB, the emission factor for very small users (e.g. 50 kWh/yr) is almost 7 times the emissions factor originally used in AMS I.A for these projects.

3.10.2. Impact on CER supply

If current energy service demand is suppressed by lack of income, relatively high energy prices and/or lack of physical access, how quickly might this change without the CDM project? In other words, how long might it take for the current emissions to reach the suppressed baseline emissions? This depends on many factors, including income growth in the host communities and changes in access. Data from the World Bank's World Development Indicators (World Bank 2014), for example, shows that, at a highly aggregated level, per capita incomes in most developing regions have, indeed, increased substantially, but this is slower in low income countries. Electricity consumption per capita, however, has not shown such consistent growth in Africa, largely due to population growth outstripping energy supply growth and electrification programmes (World Bank 2014). This data cannot necessarily be applied to specific sub-regions or project areas, but does show that significant increases in energy consumption are possible in a relatively short time frame. In terms of electrification rates, these have increased relatively rapidly for key countries, rising from 25% or 30% to 60% to 80% in as little as 10 or as many as 30 years (Bazilian et al. 2011). Clearly, the level at which the minimum service level is set will also influence the risk of over-crediting, with lower service levels being more likely to reflect potential consumption in the shorter term without the CDM.

Even if the households were not to reach the minimum service levels in the near term and the emissions factors used in these methodologies is substantially higher than in traditional methodologies, the overall impact on CER generation is likely to be very small. The total CERs projected to 2020 for the methodologies in Table 3-11 after the revisions to those methodologies is approximately 17 million. Even if all of the CERs for those methodologies are considered (i.e. before and after revision), at approximately 112 million, this is still less than 1% of the entire CDM pipeline, and so does not represent a significant impact on emissions.

3.10.3. Additionality concerns

In summary, while the introduction of the concept of suppressed demand in CDM methodologies is expanding, and will have important development impacts, it is unlikely to have a major impact on the overall additionality of CDM projects. In many project areas, it is likely that the communities could reach the Minimum Service Levels during the course of the CDM project life, although this is uncertain and will depend on local circumstances. Creating an open and transparent process of setting minimum service levels, with expert input as well as input from other stakeholders, could also help to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand principles in methodologies could be restricted to certain country groups (e.g. LDCs, under-represented countries), in which development needs are highest and the potential for over-crediting it the smallest. Even if the suppressed demand does lead to some over-crediting, the overall impact is very small, particularly if restricted geographically. More importantly, the increased contribution to sustainable development provides a strong justification for this approach to project types that address poverty and development issues.

4. Assessment of specific CDM project types

The relevant literature highlights that the likelihood of CERs representing real, measurable and additional emission reductions varies considerably among project types. Some project types do not generate revenues other than CERs. These projects have a high likelihood of being additional. Other project types are heavily promoted and/or subsidized by governments, generate significant

other revenues, or their economic feasibility is hardly impacted by CER revenues. For these projects, additionality is more questionable.

Other aspects affecting the quality of CERs also vary among project types. Perverse incentives are particularly relevant for projects that generate large CER revenues compared to the cost structure of their main business (e.g. HFC-23 projects). Baselines are particularly challenging to determine in dynamic sectors with high rates of learning and innovation and penetration of new technologies over relatively short periods of time. The length of crediting is critical for project types which are implemented earlier due to the CDM incentives.

For these reasons, this chapter evaluates the ability to deliver real, measurable and additional emissions reductions for specific CDM project types. In the following, we select important project types in Section 4.1 and assess these project types in the subsequent sections.

4.1. Project types selected for evaluation

We select the project types for evaluation mostly based on their potential CER volume in the period of 2013 to 2020 according to the current CDM project portfolio. Focusing on the period of 2013 to 2020 and on the largest CDM project types in terms of potential CER volume allows the best estimation of the quality of the overall CDM project portfolio for future new demand for CERs. Moreover, the project types with the largest market share are most critical for the overall quality of the CDM.

The specific project types selected for evaluation are provided in Table 4-1. The table also shows that these project types cover a potential CER volume of 4.8 billion CERs, which corresponds to 85% of the overall CER supply potential for the period of 2013 to 2020 (Section 2.3). This ensures a large representativeness.

Table 4-1: Project types selected for evaluation

Project type	Potential CER supply 2013 to 2020 [million]	Focus areas analyzed
Wind power	1,397	Additionality, baselines
Hydropower	1,669	Additionality, baselines
Biomass power	162	Additionality, baselines, leakage
HFC-23	375	Perverse incentive, baselines
Adipic acid	257	Perverse incentives (leakage)
Nitric acid	175	Perverse incentives, baselines
Landfill gas	163	Additionality, baselines, perverse incentives
Coal mine methane	170	Additionality, baselines
Waste heat recovery	222	Additionality, baselines
Fossil fuel switch	232	Additionality, baselines
Efficient cook stoves	2.3	Additionality, baselines
Efficient lighting	3.8	Additionality
Total of all selected project types	4,829	
Total of all projects in the CDM portfolio	5,671	

Source: Authors' own compilation and calculations

4.2. HFC-23 abatement from HCFC-22 production

4.2.1. Overview

Hydrofluorocarbon-23 (HFC-23) is a waste gas from the production of hydrochlorofluorocarbon-22 (HCFC-22), which is a GHG and an ozone-depleting substance (ODS) regulated under the Montreal Protocol on Substances that Deplete the Ozone Layer. HCFCs were introduced as an alternative to the highly ozone-depleting chloro-fluorocarbons (CFCs) because of their lower ozone-depleting potential. HCFC-22 is mainly used for two purposes: as a refrigerant in refrigeration and air-conditioning appliances and as a feedstock in the production of polytetrafluoroethylene (PTFE). The production for the refrigeration and air-conditioning industry is regulated under the Montreal Protocol, whereas the production for feedstock purposes is not.

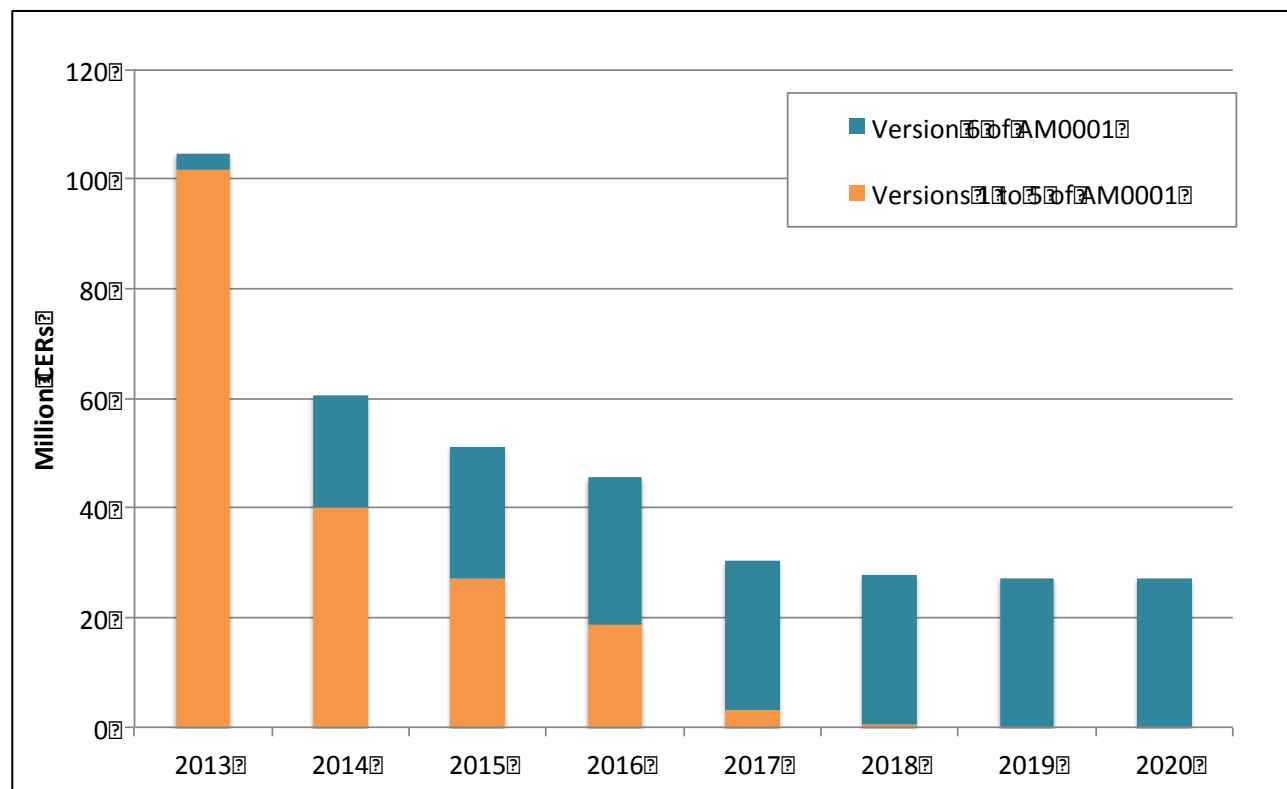
HFC-23 is a potent greenhouse gas; its global warming potential (GWP) is estimated at 14,800 for the second commitment period of the Kyoto Protocol. Emissions of HFC-23 from HCFC-22 production can be abated in two ways: a) by reducing the rate of waste gas generation (by-product rate) through process optimization and b) by capturing and destroying HFC-23 through installation and operation of high temperature incinerators. In the absence of regulations, incentives, or voluntary commitments by the industry, HFC-23 is usually vented to the atmosphere (Schneider & Cames 2014).

4.2.2. Potential CER volume

Under the CDM, 19 HFC-23 projects have been registered. Eleven projects are located in China, five in India; South Korea, Argentina and Mexico each host one project. All projects apply the baseline and monitoring methodology AM0001. In the first commitment period of the Kyoto Protocol, the abatement of HFC-23 has been the project type with the largest CER issuance: 516 million HFC-

23 CERs or 36% were issued of a total of 1.4 billion CERs by the end of 2013. The potential CER supply for the period of 2013 to 2020 is estimated using a bottom-up model based on a detailed evaluation of the information in PDDs and monitoring reports from all 19 projects (Schneider & Cames 2014). In estimating the potential CER supply we differentiate between CERs from the application of versions 1 to 5 and version 6 of the applicable baseline and monitoring methodology AM0001 due to the significant differences between these methodology versions. The potential CER supply for the period of 2013 to 2020 is illustrated in Figure 4-1; it amounts to approx. 375 million CERs for the entire period, with 191 million from the application of version 1 to 5 and 184 million from the application of version 6 of the methodology AM0001.

Figure 4-1: CER supply potential of HFC-23 projects



Sources: Authors' own compilation

4.2.3. Additionality

All versions of the applicable baseline and monitoring methodology AM0001 consider HFC-23 projects to be automatically additional, as long as no regulations to abate HFC-23 are in place in the host country. This rule seems appropriate. Prior to the CDM, none of the plants in developing countries had equipment to destruct destroy HFC-23; HFC-23 generated in the production process was vented to the atmosphere. The same holds for plants that are not eligible for crediting under the CDM because they started commercial operation after 31 December 2001. Plant operators do not have economic incentives to install HFC-23 destruction equipment, as the installation and operation does not reduce costs or generate any significant revenues other than from CERs.⁴⁵ Based on these considerations, we assess that this project type is very likely to be additional.

⁴⁵ Schneider & Cames (2014) report that plant operators could sell HF which is a by-product from flue gas treatment. However, these revenues are likely lower than the costs for HFC-23 destruction.

4.2.4. Baseline emissions

HFC-23 generation from HCFC-22 production depends on two factors: the amount of HCFC-22 production and the ratio between HFC-23 generation and HCFC-22 production, which is often referred to as 'waste generation rate'. The applicable methodology AM0001 determines baseline emissions of HFC-23 based on these two factors, by multiplying the baseline HCFC-22 production with the baseline waste generation rate.⁴⁶ How these two parameters are calculated, has evolved over time.

The approaches changed over time with a view to addressing perverse incentives which are a particular concern for the crediting of HFC-23, due to the low technical abatement costs⁴⁷ and significant profits which can accrue from CER revenues and could exceed the costs of HCFC-22 production (Schneider 2011, UNFCCC 2011b, TEAP 2005). Significant perverse incentives were observed in two JI projects in which plant operators increased the waste generation rate to unprecedented levels once methodological safeguards were abandoned (Schneider & Kollmuss 2015). Perverse incentives can arise from the CDM in the following ways:

- HCFC-22 plants could operate at a higher waste generation rate than they would in the absence of the CER revenues, leading to over-crediting;
- The amount of HCFC-22 produced at CDM plants could be higher than in the absence of the CER revenues. This could lead to over-crediting if
 - HCFC-22 production is displaced at non-CDM plants that have a lower waste generation rate than the baseline rate used at the CDM plants;
 - HCFC-22 production is displaced at plants located in Annex I countries that already are required to abate HFC-23 emissions;
 - HCFC-22 is not produced for use in applications but is vented to the atmosphere;
 - The use of HCFC-22 becomes economically more attractive due to the CDM and is increasingly used compared to other less GHG-intensive alternatives;
 - The base year emissions (2009-2010) under the accelerated phase-out under the 2007 amendment to the Montreal Protocol are higher due to the CDM;
 - The implementation of the accelerated phase-out of HCFC-22 is delayed due to the CDM.
- The HCFC-22 plants could operate longer than they would in the absence of CDM revenues. This could lead to over-crediting under the same circumstances as a higher HCFC-22 production at the plants.

Robustness and conservativeness of the methodology has significantly increased over time. Perverse incentives constitute a major challenge in versions 1 to 5, whereas the conservative approach in version 6 largely avoids and compensates for perverse incentives.

For CERs issued to projects under versions 1 to 5, the amount of over-crediting is uncertain, since it hinges strongly on assumptions on HCFC-22 production levels, HFC-23 waste generation rates and the indirect effects noted above. Munnings et al. (2016) suggest that under-crediting due to conservative baselines may have more than compensated for the potential over-crediting from perverse incentives that these baselines were intended to curb. However, Munnings et al. (2016) make several assumptions that seem rather implausible. For example, they assume that in the absence of the CDM, some plants would have produced more HCFC-22 than they did under the CDM. As a result, we do not find their arguments persuasive.

⁴⁶ Versions 1 to 5 of methodology AM0001 do not explicitly calculate baseline emissions but directly calculate the emission reductions.

⁴⁷ Schneider & Cames (2014), Appendix, provide an overview of technical abatement costs for HFC-23 destruction.

Under version 6, on the other hand, net under-crediting (or net emissions benefit) is very likely since the methodology uses an ambitious default value of 1.0% for the baseline waste generation rate and caps the amount of HCFC-22 production that is eligible for crediting in a more conservative manner (Erickson et al. 2014). However, as of 1 January 2016, no credits have been issued under version 6.

4.2.5. Other issues

Continued low CER prices could jeopardize continued abatement activities at CDM HFC-23 project sites, an unfortunate outcome given the very inexpensive abatement opportunities they provide. At the same time, the failure of the CDM market to ensure continued abatement creates the opportunity for other policies that could yield even greater net emission benefits, especially if no credits are generated that could be also used to increase emissions elsewhere. For example, China recently launched a results-based finance programme that supports HFC-23 abatement in CDM and non-CDM plants (NDRC 2015). This programme helps support HFC-23 abatement across the sector in China. However, continued abatement in other CDM-eligible countries is less certain.

There are also other means to ensure these important abatement opportunities are not lost. Emissions of HFC-23 from HCFC-22 production can be regulated through the Montreal Protocol and for new facilities that have not yet installed GHG abatement, the Protocol's Multilateral Fund (MLF) for GHG abatement can provide financial support (Schneider & Cames 2014).

Note also that continued crediting under the CDM could also create perverse incentives for policy makers not to pursue alternative policies such as these, which address emissions without yielding CERs.

4.2.6. Summary of findings

Past changes to methodologies have now improved the integrity of these projects. If they are operated they are likely to yield more emissions reductions than CERs – i.e. a net mitigation benefit. However, continued low CER prices jeopardize their continued operation in some countries.

Additionality	<ul style="list-style-type: none"> • Likely to be additional
Over-crediting	<ul style="list-style-type: none"> • Risk of perverse incentives largely addressed in most recent methodology (version 6). • Version 6 could lead to under-crediting (net mitigation benefit)
Other issues	<ul style="list-style-type: none"> • Low CER prices jeopardizes continued operation • Emissions could be addressed through Montreal Protocol • Perverse incentives to avoid domestic regulation

4.2.7. Recommendations for reform of CDM rules

The necessary changes in AM0001 have been implemented in recent years. No changes in CDM rules are needed.

4.3. Adipic acid

4.3.1. Overview

Adipic acid is an organic chemical that is used as a building block in a range of different products, most importantly polyamide, often referred to as 'nylon'. Other applications include the production of polyurethanes and plasticizers. Adipic acid is a globally traded commodity, with more than one-third of the production traded internationally. Nitrous oxide (N₂O) is an unwanted by-product of adipic acid production. The formation of N₂O cannot be avoided; it is the result of using nitric acid

to oxidize cyclohexanone and/or cyclohexanol. Generally, the amount of N₂O generated varies very little over time and among plants.

N₂O in the waste gas stream can be abated in different ways: by catalytic destruction, by thermal decomposition, by using the N₂O for nitric acid production, or by recycling the N₂O as feedstock for adipic acid production (Schneider, L. et al. 2010). These methods typically reach an abatement level of about 90% (IPCC 2006, p. 3.30, Ecofys et al. 2009, p. 44). However, plants implemented under CDM and JI achieved significantly higher abatement levels of approx. 99% in the case of CDM and 92% to 99% in the case of JI, apparently through the strong economic incentives from the CDM and JI (Schneider, L. et al. 2010).

4.3.2. Potential CER volume

Under the CDM, four projects were registered. Two projects are located in China, one is in Brazil and one in South Korea. All four CDM plants had no abatement installed before project implementation and applied either thermal or catalytic abatement. The four implemented CDM plants cover only a part of the adipic acid production in developing countries because the applicable CDM methodology AM0021 is limited to plants that started commercial operation before 2005. Since then, five new plants are known to have started commercial operation in China; none of them abates N₂O emissions (Schneider & Cames 2014). Based on a bottom-up model used by Schneider & Cames (2014), the four CDM projects could generate about 257 million CERs in the period of 2013 to 2020.

4.3.3. Additionality

The applicable methodology AM0021 combines the approaches included in the different approaches to demonstrate additionality. Version 1 establishes three criteria for additionality demonstration: no regulations should require N₂O abatement, the project should not be common practice and it should not be economically viable. Versions 2 and 3 refer to the additionality tool and hence the investment analysis is not mandatory for additionality demonstration, as compared to version 1. Nevertheless, all four registered projects conduct an investment analysis and determine the net present value (NPV). Versions 2 and 3 also require reassessment of additionality during the crediting period if new NO_x regulations were introduced.

N₂O abatement from adipic acid production can be regarded as highly likely to be additional, for several reasons. Firstly, none of the non-Annex I countries in which adipic acid is produced have regulations in place to abate N₂O. Secondly, for thermal or catalytic destruction of N₂O, plant operators have no economic incentives to abate N₂O emissions. The abatement generates steam as a by-product; however, the cost savings or revenues are lower than the investment and operation and maintenance costs. Based on a review of PDDs and literature information, the technical abatement costs are estimated at €0.3/t CO₂e, with a range from €0.1/t CO₂e to €1.2/t CO₂e (Schneider & Cames 2014).

Thirdly, the abatement of N₂O from adipic acid production is not common practice in non-Annex I countries. In Western industrialized countries, N₂O has been abated voluntarily since the 1990s. In non-Annex I countries, only one plant in Singapore had abatement technology installed prior to the CDM (Schneider, L. et al. 2010). None of the plants commissioned after 2004, which are not eligible for crediting under the CDM, installed N₂O abatement technology.

4.3.4. Baseline emissions

Baseline emissions of N₂O are determined by multiplying the amount of adipic acid production eligible for crediting with a baseline emission factor. The methodology further estimates baseline

emissions from steam generated during the catalytic or thermal destruction of N_2O . Baseline emissions from steam generation are very small compared to baseline emissions of N_2O .

The baseline emission factor is determined as the lower value between the actual rate of N_2O formation and a default value of 270 kg N_2O / t adipic acid, which corresponds to the lower end of the uncertainty range of the IPCC default value of 300 kg / t adipic acid (IPCC 2006). This approach is used in all three methodology versions and intends to exclude the possibility of manipulating the production process to increase the rate of N_2O formation. Versions 2 and 3 require the actual N_2O formation rate to be determined in two ways: 1) based on the consumption of nitric acid and the ratio of N_2O to N_2 in the off-gas, and 2) based on direct measurements of N_2O in the off-gas adjusted by a 5% discount factor to account for measurement uncertainty. As a conservative approach, the lower resulting value of the two ways is used to determine the baseline emission factor. Overall, the methodology ensures that the baseline emission factor is determined in a conservative manner. The rate of N_2O formation typically observed is higher than the default value of 270 kg / t adipic acid, which could potentially lead to under-crediting of few percentage points.

The amount of adipic acid production that is eligible for crediting is capped in all three methodology versions with a view to avoiding incentives to expand the production as a result of the CDM. Version 2 and 3 establish the cap as the highest annual production in the three years prior to the implementation of the project activity. Version 1 does not provide a procedure to determine a cap but specifies that the methodology is “only applicable for installed capacity (measured in tons of adipic acid per year) that exists by the end of the year 2004”. There has been controversy about how this requirement is to be interpreted. Following a request for clarification (AM_CLA_0148), the Methodologies Panel recommended using production data from three historical years, similar to Versions 2 and 3. However, the CDM EB concluded that the panels' clarification “provides too extensive interpretation to an older version of methodology” and clarified instead that the cap should be determined as the “validated maximum daily production of adipic acid multiplied by 365 days multiplied by the operational rate”.⁴⁸ This was further interpreted in a way that allowed plants to seek credits beyond their annual design capacity specified in PDDs. All four CDM projects were registered with Version 1 of the methodology. Two projects (0099 and 0116) recently renewed their crediting period, applying Version 3 of the methodology, which lead to caps that are 14.8% and 13.9% lower than the caps applicable in their first crediting period.

While the methodology intended to avoid production shifts through caps on the amount of production that is eligible for crediting, data on adipic acid production, plant utilisation and international trade patterns suggest that carbon leakage, i.e. a shift of production from non-CDM plants to CDM plants, occurred during the economic downturn in 2008 and 2009 (Schneider, L. et al. 2010). Such production shifts do not only lead to distortions in the adipic acid market but can also lead to over-crediting if N_2O is abated in the non-CDM plants. Schneider, L. et al. (2010) estimate that carbon leakage leads to over-crediting of approx. 6.3 MtCO₂e or about 17% of the CERs from adipic acid projects issued in 2008 and approx. 7.2 MtCO₂e or about 21% of the CERs from adipic acid projects in 2009. These effects could thus outweigh the conservative determination of the baseline emission factor.

The lenient interpretation of historical production capacity in version 1 of the methodology considerably contributed to the carbon leakage. However, the more conservative approach for the establishment of the cap on adipic acid production in versions 2 and 3 of the methodology addresses this issue only partially. In a global economic recession, adipic acid production could fall well below historical rates of plant utilisation. Depending on the CER prices, CDM plants operators would then have significant competitive advantage over non-CDM plants, which could lead to similar produc-

⁴⁸ Report of the 48th meeting of the EB, paragraph 24.

tion shifts as observed in 2008 and 2009. As for HCFC-22 production, the underlying issue is that carbon market revenues can have a strong impact on adipic acid production costs. Carbon leakage is unlikely to occur at current market prices for CERs, but could become an issue again if CER prices increased.

4.3.5. Other issues

No other issues were identified.

4.3.6. Summary of findings

Adipic acid projects have a very high likelihood of additionality. The baseline emission factor is determined in a conservative manner that could lead to a few percentage points of under-crediting. The methodology does not include sufficient provisions to address carbon leakage. This could lead to significant over-crediting in times of higher CERs prices and when the adipic acid production capacity significantly exceeds demand.

Additionality	<ul style="list-style-type: none"> • Likely to be additional
Over-crediting	<ul style="list-style-type: none"> • Most recent methodology could lead to slight under-crediting • Leakage could lead to significant over-crediting in times of higher CER prices
Other issues	<ul style="list-style-type: none"> • None

4.3.7. Recommendations for reform of CDM rules

Based on the considerations above, we recommend revising the applicable CDM methodology as follows:

- The provisions for additionality demonstration could be simplified, as this project type can be considered to be very likely additional. We recommend considering this project type as automatically additional, as long as no regulations require N₂O abatement.
- The potential for carbon leakage should be addressed. We recommend introducing a standardized ambitious emission benchmark to determine baseline emissions. Carbon leakage would be avoided most effectively if a consistent emissions benchmark is used for all plants around the world, including plants under ETSSs, and if it is set at or below the abatement level typically achieved in the industry. A standardized global emission benchmark for all adipic acid plants, regardless of policy approach or specific emission trading mechanism, could provide a level playing field for the adipic acid industry and eliminate potential economic distortions. Adipic acid production is particularly amenable to a standardized global benchmark because it is a highly globalized industry, and all plants are very similar in structure and technology (Schneider, L. et al. 2010). We recommend a level at or below 30 kg/t adipic acid, which reflects the abatement level achieved by the large majority of producers world-wide.
- If a standardized ambitious emissions benchmark is introduced, the methodology could be further simplified as measurements and calculations of the rate of N₂O formation would not be necessary.

4.4. Nitric acid

4.4.1. Overview

Nitric acid is mainly used for the production of synthetic fertilizers and explosives. In the industrial production of nitric acid, ammonia (NH_3) is oxidized over precious metal gauzes (primary catalyst) to produce nitrogen monoxide (NO), which then reacts with oxygen and water to form nitric acid. N_2O is an unwanted by-product generated at the primary catalyst. The better a primary catalyst functions, the lower the N_2O emissions. Nitric acid is produced during production campaigns of typically 3-12 months (Kollmuss & Lazarus 2010).

N_2O emissions from nitric acid production can be abated in three ways (Schneider & Cames 2014):

- **Primary abatement** prevents the formation of N_2O at the primary catalyst. According to gauze suppliers, improved gauzes could potentially lead to a 30-40% reduction of N_2O formation (Ecofys et al. 2009).
- **Secondary abatement** removes N_2O through the installation of a secondary N_2O destruction catalyst in the oxidation reactor. The abatement efficiency of the secondary catalyst is often estimated as ranging from 80% to 90%. However, in practice it varies in CDM plants from about 50% to more than 90%. Registered CDM projects achieved an average abatement efficiency of 70% (Kollmuss & Lazarus 2010, Debor et al. 2010).
- **Tertiary abatement** removes N_2O from the tail gas through either thermal or catalytic decomposition. Tertiary abatement can reduce N_2O emissions by more than 90% but involves larger investment and operating costs and more demanding technical requirements than secondary abatement. Registered CDM projects achieved an average abatement efficiency of 86% (Kollmuss & Lazarus 2010, Debor et al. 2010).

Four methodologies have been approved for N_2O abatement from nitric acid production:

- **AM0028** is applicable to tertiary abatement in plants that started commercial operation before 2006. 19 projects used the methodology. In 2013, the methodology was limited to caprolactam production in 2013, and replaced by amending the methodology ACM0019.
- **AM0034** is applicable to secondary abatement in plants that started commercial operation before 2006. 56 projects used the methodology. In 2013, the methodology was withdrawn and replaced by amending the methodology ACM0019.
- **AM0051** is also applicable to secondary abatement in plants that started commercial operation before 2006. The methodology was never used and was withdrawn in 2013. It is therefore not considered in detail in this study.
- **ACM0019** is applicable to both secondary and tertiary abatement and both existing and new plants. 26 projects used the methodology. Since 2013, this is the only valid methodology for nitric acid projects.

Table 4-2 provides an overview of the main features of and differences between the methodologies.

Table 4-2: Overview of methodologies for nitric acid projects

	AM0028	AM0034	AM0051	ACM0019
Projects	19	56	None	26
Technology	Tertiary	Secondary		Secondary and tertiary
Validity	Limited to capro-lactam in 2013	Withdrawn in 2013		Valid
Applicability	Plants that started operation before 2006			Existing and new plants
Additionality demonstration	Additionality tool			Automatically additional
Baseline emission factor	Ex-post measurements	Ex-ante measurement campaign	Ex-post measurements	Emission benchmark
Cap on baseline production	Design capacity			No cap
Re-assessment of baseline scenario or additionality	In case of new NO _x regulations			Not applicable

Sources: Authors' own compilation

4.4.2. Potential CER volume

Under the CDM, 97 projects were registered and another four projects were submitted for validation as of January 2014. China is the most important host country with 44 projects. Other important countries are India (5 projects), Uzbekistan (6 projects), South Africa (5 projects), and Brazil, Egypt, Israel and South Korea which host each four projects. Among the 97 registered CDM projects, only 51 have issued CERs as of January 2014. In the current market situation, it is likely that most of the remaining 47 projects have not been implemented. Based on a bottom-up model developed by Schneider & Cames (2014), the 101 published CDM projects could generate approx. 175 million CERs in the period of 2013 to 2020. Potential new projects that have not yet been developed or published are estimated to have a potential of approx. 31 million CERs over the same period.

4.4.3. Additionality

Up to 2011, all three approved methodologies (AM0028, AM0034, AM0051) used the additionality tool to demonstrate additionality. In 2011, ACM0019 was adopted, which deems projects to be automatically additional and employs a dynamic emission benchmark to determine baseline emissions.

N₂O abatement from nitric acid production can be regarded as highly likely to be additional, for similar reasons as for HFC-23 abatement from HCFC-22 production and N₂O abatement from adipic acid production. Non-Annex I countries usually do not have regulations which address N₂O emissions from nitric acid production. Prior to the CDM, secondary or tertiary abatement is not known to have been used in non-Annex I countries and N₂O is usually released to the atmosphere. While plant operators have economic incentives to take primary abatement measures to reduce the rate of N₂O formation, they do not save any costs or generate any revenues – other than car-

bon market revenues – from the installation of secondary or tertiary abatement. Based on a review from PDDs and literature information, the average technical abatement costs are estimated at €0.9/t CO₂e for secondary abatement and at €3.2/t CO₂e for tertiary abatement (Schneider & Cames 2014). For these reasons, in our assessment, the approach in ACM0019 of assuming this project type automatically additional seems reasonable.

4.4.4. Baseline emissions

Baseline emissions are determined by multiplying the amount of nitric acid production with a baseline emission factor. The methodologies AM0028, AM0034 and AM0051 limit the amount of nitric acid production eligible for claiming emission reductions to the design capacity of the plant in 2005; ACM0019 has no such cap. The baseline emissions factor is determined in three different ways in CDM methodologies: through measurement campaigns conducted prior to the installation of the abatement technology (AM0034), through measurements during the crediting period (AM0028 and AM0051), and by using an emissions benchmark (ACM0019).

All three methodologies using measurements (AM0028, AM0034 and AM0051) aim to provide safeguards to avoid perverse incentives to artificially increase the rate of N₂O formation in order to increase CDM revenues (UNFCCC 2012b; UNFCCC 2013; Schneider & Cames 2014). In AM0028, the baseline emission factor is capped to the level of previous monitoring periods if project participants do not use a primary catalyst that is common practice in the region or has been used in the nitric acid plant during the last three years and if they cannot justify the use of a different catalyst. In addition, key operating conditions of the plants cannot be changed during project implementation. In AM0034, the methodology requires a new baseline measurement campaign to be conducted if the chemical composition of the primary catalyst is changed after project implementation. While these provisions aimed to avoid perverse incentives to increase the N₂O formation due to the CDM, they provide economic disincentives to plant operators to use primary catalysts that reduce the formation of N₂O, as this would lower their CER revenues and could involve additional costs for conducting a new baseline campaign (UNFCCC 2012b; UNFCCC 2013; Schneider & Cames 2014). However, advanced primary catalysts that increase the NO yield and lower the generation of the by-product N₂O are emerging in the industry. They have become widespread in Europe, are gaining market shares in other parts of the world, and have been used in a number of CDM projects prior to their start (UNFCCC 2012b). It is thus possible that some CDM projects applying the AM0034 or AM0028 methodology would, in the absence of the CDM incentives, employ more advanced primary catalysts, in particular over the time frame of three crediting periods, leading to over-crediting (UNFCCC 2012b).

The Methodologies Panel further identified that some plants using the AM0034 methodology had established baseline emission factors which are significantly above the uncertainty range of the IPCC default values and which would result in considerable economic losses for the plant operators (UNFCCC 2012b). The highest reported value from a baseline measurement campaign is 37.0 kg N₂O / t nitric acid, while the highest IPCC default value is 9.0 kg N₂O/t nitric acid, with an uncertainty range of ±40% (IPCC 2006). Such high emission factors indicate that these plants are operated at a high specific ammonia consumption. Plant operators could intentionally reduce the production efficiency during the baseline campaign in order to achieve a higher CDM baseline emission factor (UNFCCC 2012b). Moreover, while inefficient plant operation can be observed in Non-Annex I countries, it seems questionable whether the observed levels of nitrogen loss would continue over the course of three crediting periods. On the other hand, it is important to take into account that the IPCC default emission factors were estimated at times when much less information was available on N₂O formation from nitric acid plants. In particular, continuous measurements over the length of a production campaign, with increasing N₂O emissions towards the end of the

campaign, were not available. The values and their assigned uncertainty should therefore not be outweighed.

To address these two issues, the CDM EB withdrew the AM0034 and AM0051 methodologies and limited the applicability of the AM0028 methodology to caprolactam plants in 2013. At the same time, the EB revised the methodology ACM0019, distinguishing the approach between plants that used AM0028 or AM0034 in their first crediting period and other (mostly newer) plants. For AM0028 and AM0034 plants up to their design capacity, the methodology uses the lower value between the historical baseline emissions during the first crediting period under AM0028 and AM0034 and a default value set at the upper end of the uncertainty range of the IPCC default value and declining by 0.2 kg N₂O/t nitric acid per year to reflect technological innovation in primary catalysts that may reduce emissions over time. This approach caps the baseline emissions particularly for those plants that have established baseline emission factors above the IPCC uncertainty range. It also reduces the maximum amount of baseline emissions that can be claimed over time to account for technological innovations in primary catalysts. For production above the design capacity and other (mostly newer) plants, the methodology uses a more ambitious emissions benchmark set at 3.7 kg N₂O/t nitric acid in 2013 and declining by 0.2 kg N₂O/t nitric acid per year, up to a level of 2.5 kg N₂O/t nitric acid in 2020 which is maintained in subsequent years.

The new approach has several advantages but also some shortcomings:

- Importantly, using default emission benchmarks – whatever the real baseline emissions from a specific plant are – fully avoids perverse incentives for plant operators not to use advanced primary catalysts that reduce the formation of N₂O. Plant operators have incentives to innovate, as this lowers their project emissions and increases the number of CERs issued;
- Using default emission benchmarks further fully avoids the risk that plant operators could intentionally increase the rate of N₂O formation during a baseline campaign in order to maximize CER revenues;
- Using default emission benchmarks can lead to over-crediting in plants that actually have lower N₂O formation rates and to under-crediting in plants that actually have higher N₂O formation rates. Both under- and over-crediting is likely to occur since the N₂O formation rate observed in CDM projects varies by a factor of 10 from 3.5 to 37.0 kg N₂O/t nitric acid, with an average value of 8.6 kg N₂O/t nitric acid (UNFCCC 2012b). Significant over- and under-crediting can have several unintended consequences (Schneider et al. 2014). Plants with a high N₂O formation rate may not be able to reduce their project emissions significantly below the emissions benchmark and may thus not be implemented – although their implementation would be possible with a project-specific baseline. Such ‘lost opportunities’ could increase the global cost of GHG abatement.

The overall impact on environmental integrity depends on the methodology and plant type (Table 4-3). For newer plants, the emission benchmark declining from 3.7 to 2.5 kg N₂O / t nitric acid is rather conservative and will likely lead to under-crediting for most – if not all – plants. For plants that used AM0028 or AM0034 in the first crediting period, the declining project-specific benchmark in ACM0019 is a reasonable baseline on average over all projects in our assessment; projects with higher baseline emission rates than the IPCC range will receive less CERs, while some over-crediting could occur for projects that adopt more advanced catalysts at a faster rate than the decrease of 0.2 kg N₂O / t nitric acid per year foreseen in the methodology. The use of AM0028 and AM0034 could lead to over-crediting in some instances, due to the issues identified above. Considering all plant types and methodology versions together, it seems likely that the approaches for

baseline emissions overall reasonably provide for environmental integrity; the low or moderate levels of over-crediting that could occur under AM0028 and AM0034 could be compensated by significant under-crediting for newer plants applying ACM0019. Over time, the quality of CERs will increase due to the increased phase-in of ACM0019.

Table 4-3: Assessment of environmental integrity of nitric acid projects

Plant type	Methodology	Identified environmental integrity issues	2013-2020 CER potential	Potential for under- or over-crediting
Plants that started operation before 2006: 1 st CP	AM0028 AM0034	<ul style="list-style-type: none"> Perverse incentives not to adopt technologies that reduce the rate of N₂O formation Risk of manipulation of the production process during the baseline campaign 	73 million	Low or moderate over-crediting
Plants that started operation before 2006: 2 nd and 3 rd CP	ACM0019	<ul style="list-style-type: none"> Under-crediting for plants with higher N₂O formation rates than the IPCC range Over-crediting for plants that adopt advanced primary catalyst technologies at faster rates 	70 million	Neutral / Low over- or under-crediting
Newer plants or plants that did not use AM0028/AM0034	ACM0019	<ul style="list-style-type: none"> None 	32 million	Moderate to significant under-crediting

Sources: Authors' own compilation

4.4.5. Other issues

No other issues were identified.

4.4.6. Summary of findings

Nitric acid projects have a very high likelihood of additionality. Baseline emissions can be over- or under-credited; overall, they are likely to reasonably ensure environmental integrity for 2013-2020 CERs, with the average quality of CERs improving over time.

An important lesson learned from this project type is that the potential for technological innovation and perverse incentives was not sufficiently considered when approving the initial methodologies. For sectors that could undergo significant technological innovation, using historic data or measurement campaigns to establish a baseline for up to 21 years is debatable. The more recent ACM0019 methodology accounts for technological innovation by using an emission benchmark that declines over time.

Additionality	<ul style="list-style-type: none"> • Likely to be additional
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Over-crediting	<ul style="list-style-type: none"> • Most recent methodologies lead to under-crediting • Overall, little risks of overall over-crediting
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Other issues	<ul style="list-style-type: none"> • None
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4.4.7. Recommendations for reform of CDM rules

No recommendations.

4.5. Wind power

4.5.1. Overview

CDM wind power projects mainly use four methodologies.⁴⁹ The vast majority of projects (more than 99% of all CDM wind projects) feed electricity into the grid.⁵⁰

According to the UNEP DTU (2014), by the end of 2013, an overall wind power capacity of 111 GW had been installed by projects using the CDM. The main contributors to this overall capacity are China (83 GW), India (10 GW), Mexico and Brazil (both 4 GW). The other 36 countries with CDM wind power projects account for 10 GW of installed capacity in total.

Figure 4-2, Figure 4-3 and Figure 4-4 illustrate the development of wind power capacity and the use of the CDM in China, India and Brazil.⁵¹ In China, installation of wind power capacity accelerated from 2005 onwards. A comparison of the total wind power capacity installed and the capacity installed by projects using the CDM⁵² over the 2005 to 2012 period (Figure 4-2) shows that CDM projects accounted for about 90% of the total cumulated installed capacity as of 2012 (about 75 GW). In the case of India (Figure 4-3), installed capacity increased significantly between 2005 and 2012 from 1.4 GW in 2005 to more than 15 GW in 2012. CDM projects accounted for about half (51%) of the total cumulated capacity installed as of 2012. In the case of Brazil (Figure 4-4), the total cumulated installed capacity as of 2012 was much smaller (2.5 GW). The share of CDM projects in cumulative capacity was 43% as of 2012.

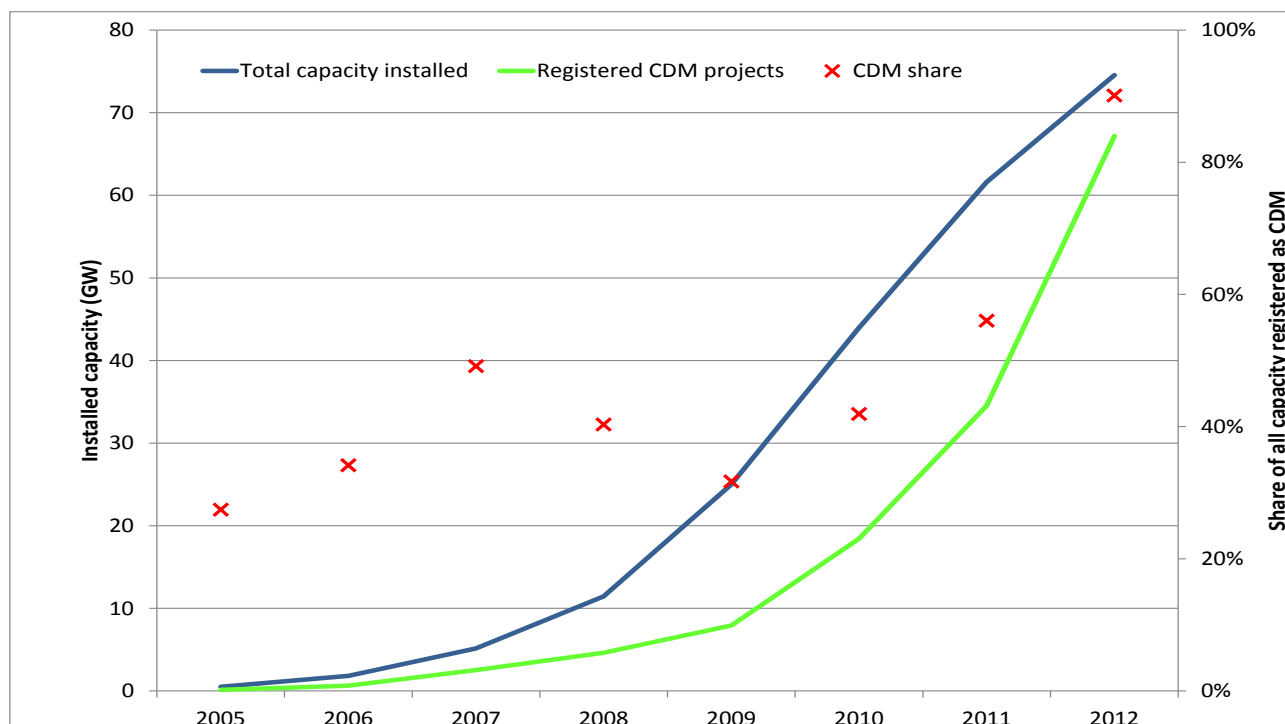
⁴⁹ ACM0002, AMS-I.A, AMS-I.D, AMS-I.F.

⁵⁰ ACM0002 (large scale), AMS-I.D (small scale).

⁵¹ China, India and Brazil are selected for the graphs in order to ensure comparability across chapters on renewable power generation since they are important CDM countries for hydropower and biomass power, too.

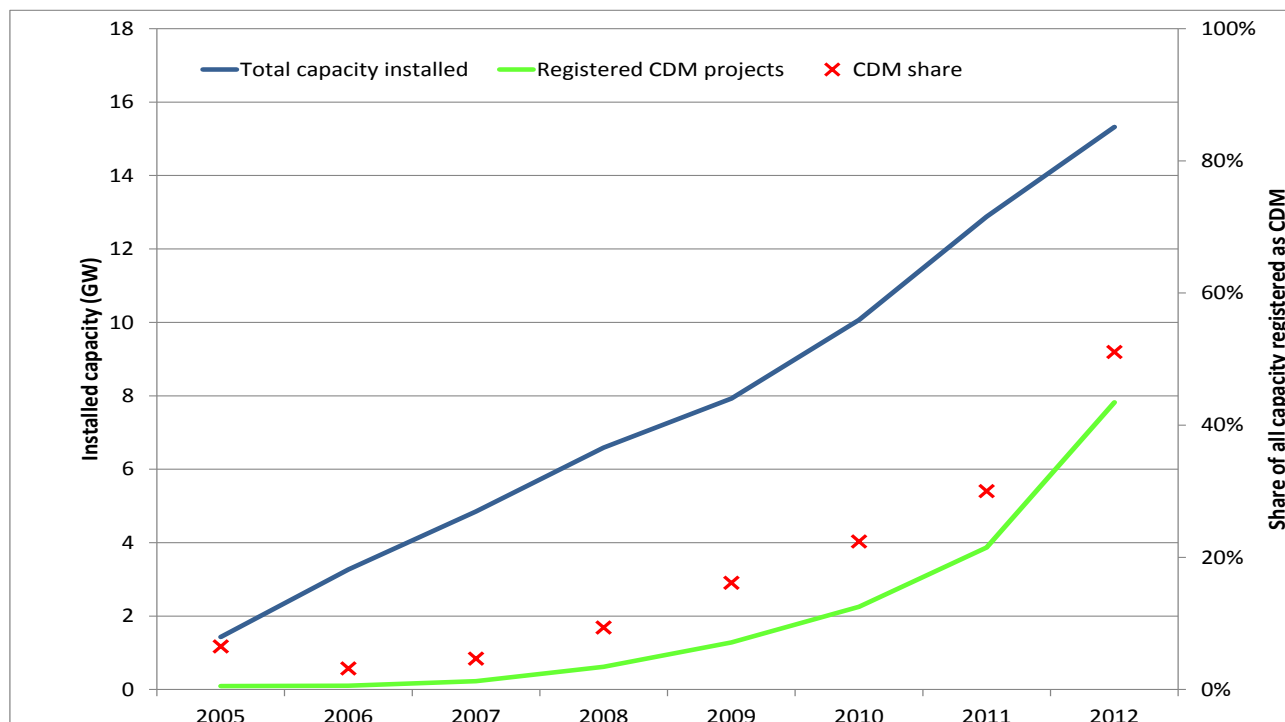
⁵² The total installed capacity between 2005 and 2012 is taken from the World Wind Energy Association statistics (WWEA 2015) and accumulated across the years. The installed capacity of projects using the CDM is taken from UNEP DTU (2014) and accumulated, too. The installation year is taken as the starting date of the crediting period. Cumulative values were used to illustrate the contribution of the CDM since annual values are misleading due to potential differences between the year of construction and the year in which the crediting period starts. Therefore, cumulative values provide a better picture of the general trend of the CDM share in total capacity installed.

Figure 4-2: Total cumulated wind power capacity installed in China between 2005 and 2012



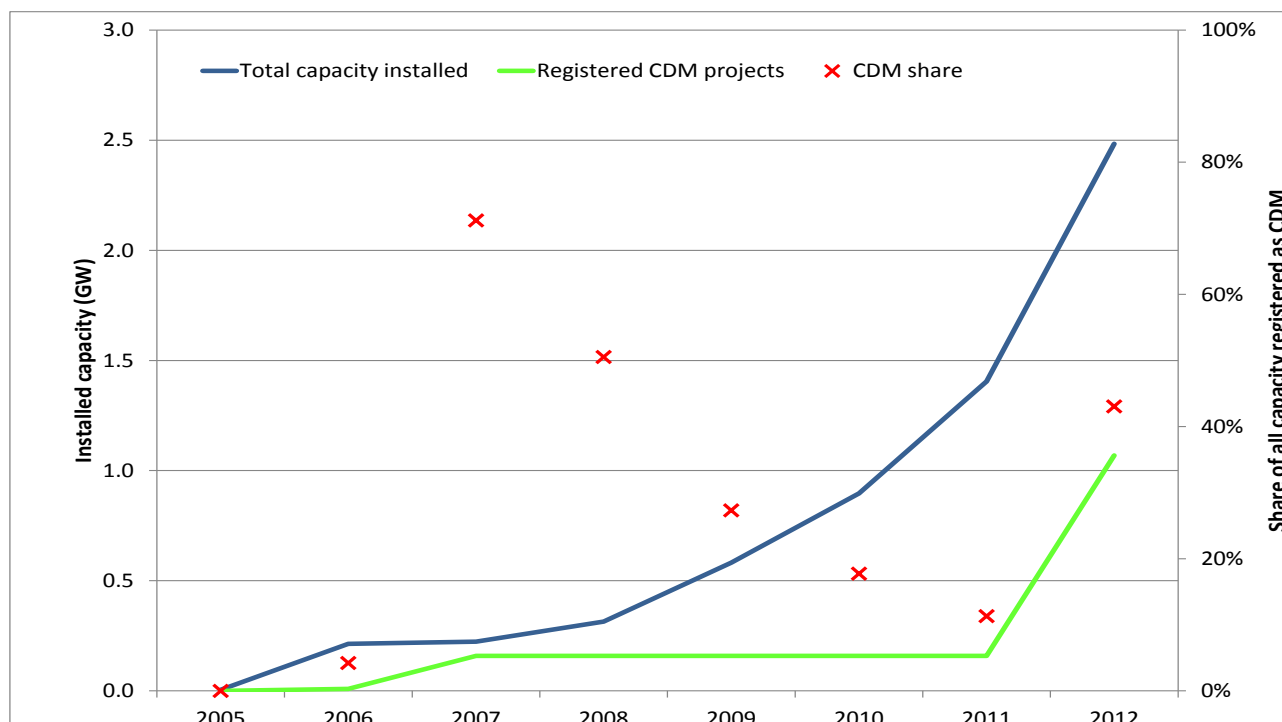
Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

Figure 4-3: Total cumulated wind power capacity installed in India between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

Figure 4-4: Total cumulated wind power capacity installed in Brazil between 2005 and 2012



Sources: UNEP DTU 2014, WWEA 2015, authors' own calculations

4.5.2. Potential CER volume

According to our own estimates, registered CDM wind power projects have the potential to issue 3.5 billion CERs by the end of their respective crediting periods, of which 1.4 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from wind power account for about one quarter of the total CER issuance potential.

4.5.3. Additionality

Large-scale wind power projects apply the methodology ACM0002 which requires using the “Tool for the demonstration and assessment of additionality” to demonstrate additionality.⁵³ In this tool, the investment analysis is one of the approaches for demonstrating additionality. Most CDM wind power projects use investment analysis. The tool for small-scale projects (“Methodological tool. Demonstration of additionality of small-scale project activities”⁵⁴) requires “an explanation to show that the project activity would not have occurred anyway due [...] to barriers”, among which one of the most important barriers is the so-called ‘investment barrier’, which generally features a similar rationale as for the investment analysis of large-scale projects.

Section 3.2 describes the general criticism associated with the investment analysis and Section 2.4 assesses for different project types the impact of CER revenues on their economic performance. According to these analyzes, for wind power projects, CER revenues lead to an increase in the internal rate of return (IRR) of two to three percentage points. An analysis by the World Bank finds that “the incremental IRR from future carbon revenues in renewable energy projects, taking the World Bank’s projects as an example, is quite low” (Carbon Finance at the World Bank 2010). In

⁵³ Current version 07.0.0 (EB 70, Annex 8).

⁵⁴ Current version 10.0 (EB 83, Annex 14).

this analysis, the incremental IRR for renewable energy projects amounts to 1.7% for a purchase period of 10 years and an assumed CER price of \$10/t. Another analysis finds that “wind, hydro and biomass projects experience only a small increase in profitability through CDM” and that “the change in profitability caused by regional variables is greater than the CDM’s impact for wind, hydro and biomass”⁵⁵ (Schneider, M. et al. 2010). From these analyzes, it can be concluded that the CDM impact in the profitability of wind power plants is generally relatively low and that the ‘signal’ provided by the CDM is usually much smaller than the ‘noise’ of national and regional variations in other parameters.

In addition, many countries have set up domestic support schemes in order to promote the increased use of renewables. Spalding-Fecher et al. (2012) provide an overview of several important support incentives for renewable energy generation in major CDM countries (such as China and India) and find “that national policies on electricity tariffs for renewable power could be a more important driver of the viability of wind, hydropower and biomass projects than the CDM is.” In the case of wind power plants in China, Bogner & Schneider (2011) point out that “the wind power boom in China is mainly driven by favourable policies and not by the CDM” and that “the majority of projects would most likely have been implemented without the CDM”. Liu (2014) elaborates on the links between the CDM and national policy in the case of wind power development in China. He finds that a decreasing national feed-in tariff can increase “CDM-supported installed capacity because more projects may comply with CDM requirements as their financial returns remain below the predefined additionality threshold”, which indicates that there is a clear interference between national policy development and the additionality requirements of the CDM. He also finds that “the reduction of technology costs combined with an increasing local manufacturing capacity has paved the way for a scaled-up deployment of wind capacity” (ibid.), which indicates that other factors than the CDM were important in the significant growth of wind power in China. However, he concludes that the CDM “effect on wind technology diffusion [...] is more than twice as high as that of technology cost and industrial policy” (ibid.). He also finds that “while domestic policies must be the engine for large-scale clean energy investments in developing countries, the international carbon offset policy can help that engine run faster, but only if the engine is running” (ibid.). For India, in comparing wind power projects registered under the CDM with those without such support, Dechezleprêtre et al. (2014) find that, “all other things being equal, CDM wind farms tend to be larger, to benefit from higher feed-in-tariffs, and to be located in windier areas, three factors which increase profitability.” According to this analysis, there is “serious evidence of non-additionality of the CDM” (ibid.). He & Morse (2013) find that “Chinese power prices are either tightly controlled by state regulators or are distorted by the presence of large state owned enterprises (SOEs)” and this leads to the conclusion that “IRR-based additionality tests are fundamentally incompatible with state-controlled power pricing regime”.

Furthermore, investment costs for wind power generators have decreased significantly in recent years, which results in wind power featuring (in many cases) competitive levelized costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013). In addition, IRENA (2015) also shows that specific investments costs for onshore wind power plants are significantly lower in China and India than in OECD and ‘rest of the world’ countries. Similarly, Schmidt (2014) finds that the risk associated with low-carbon investment is higher in some parts of the world than in others. In an analysis for industrialised and low-income countries (using typical values for costs of capital in these countries), he finds that due to the higher cost of capital in low-income countries, levelized costs of electricity for onshore wind power plants could be as much as 46% higher than in low-risk countries. Altogether, the available information indicates that the profitability of wind power

⁵⁵ In this analysis, regional factors are the electricity tariff, the load factor and the discount rate.

plants has generally improved. However, there is also a significant dependence of the profitability on regional circumstances.

Overall, due to the limited impact of CER revenues on the profitability of wind power plants, the widespread introduction of domestic support schemes and the significant decrease of wind power costs, we consider the additionality of wind power projects as generally questionable in the context of the CDM, at least for countries with support schemes, low investment costs for wind power and low investment risks.

4.5.4. Baseline emissions

Baseline emissions of CDM wind power projects feeding electricity into the grid include CO₂ emissions from fossil-fired power plants that are displaced due to the project activity. In most cases, the corresponding baseline CO₂ emission factor is estimated using the “Tool to calculate the emission factor of an electricity system”⁵⁶ (Box 4-1).

Box 4-1: The grid emission factor tool

The grid emission factor is calculated as the “combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM)”.⁵⁷ According to the tool, “the operating margin is the emission factor that refers to the group of existing power plants whose current electricity generation would be affected by the proposed CDM project activity. The build margin is the emission factor that refers to the group of prospective power plants whose construction and future operation would be affected by the proposed CDM project activity.”

In the tool, several approaches for estimating the combined margin are presented, depending on the specific conditions of the project and data available. In general, the approach of using a combination of OM and BM, depending on the type of project, is appropriate. It suitably reflects that CDM projects could have short-term impacts on the dispatch of power plants and long-term impacts on the power plants built, and different weights for the OM and the BM can be applied (depending on the crediting period and on whether it relates to a project using intermittent or non-intermittent sources), which also can be considered appropriate. A number of specific issues arise from the tool:

In many cases, so-called low-cost and must-run power plants are not considered in the calculation of the CO₂ grid emission factor, which may lead to higher baseline emissions per amount of electricity produced. Neglecting low-cost/must-run power plants, such as renewables or nuclear power, may generally be considered adequate for the estimation of the operating margin (since low-cost/must-run power plants can be expected to be running irrespective of any other power plant in the system). However, an increasing share of renewables (e.g. wind or solar) in the system may lead to a situation in which renewable power generation is at the margin in some hours, i.e. an additional kilowatt hour of renewable electricity does not displace fossil fuels in that hour. In some countries, for example, wind power plants are switched off when electricity supply exceeds demand in order to ensure a stable electricity system. Furthermore, ‘low-cost’ power plants are not clearly defined and some of them may be dispatchable (such as biomass). Overall, the provision of excluding low-cost/must-run power plants may lead to an overestimation of baseline emissions.⁵⁸

⁵⁶ Current version 04.0 (EB 75, Annex 15).

⁵⁷ AMS-I.D, version 17 (EB 61, Annex 17).

⁵⁸ It has to be noted, however, that in the case the country has a large share of low-cost/must-run power plants (more than 50%), e.g. hydro, the simple adjusted operating margin has to be used. In that case, whenever hydro electricity provides sufficient electricity to cover the load demand in a certain hour, this hour is counted as not emitting. This leads to lower baseline emission factors overall than the simple operating margin. The implicit assumption is that water would be spilled in that hour if additional (i.e. CDM) power

Also, both the operating and the build margin approaches are based on historical production and installation data if the option of determining the grid emission factor at the validation stage (ex-ante) is chosen. The resulting baseline grid emission factor is then kept constant throughout the crediting period and only updated at the renewal of the crediting period. This approach does not reflect the general trend towards an increasing share of less-emitting power sources in the electricity mix of many countries. It is oriented to past power systems (backward-looking perspective) rather than to the actual power systems during the crediting period with a higher penetration of renewables (forward-looking perspective). This is especially problematic in countries with a rapidly changing or expanding electricity system. In countries with a growing share of renewable energy capacities, this approach may lead to an overestimation of baseline emissions. However, due to the long-lived capital stock in the electricity sector, changes of the grid emission factor are only gradual (i.e. take several years) in case the power system as a whole is not expanding fast. An advantage of using historical data is that it relies on observed and objective information, whereas scenarios for the future development of the power system may be prone to uncertainty and use of unrealistic assumptions.⁵⁹ Therefore, the determination of the grid emission factor based on historical data is not considered problematic per se but should be adjusted to account for trends in the sector.⁶⁰ Another option for determining the grid emission factor is the ex-post determination during monitoring. This approach is certainly adequate since it reflects the current state of the power sector.

With regard to the build margin, CDM projects are generally excluded from the estimation of the CO₂ emission factor. CDM projects only need to be gradually included if they comprise a significant share of power plants built in the last ten years. This approach can generally be considered adequate, especially in countries with an already significant share of renewable electricity generation or promotional policies for renewables in place, in which case a neglect of CDM projects in the build margin would not be a plausible representation of what would have happened in the absence of the project. This approach therefore addresses the risk of over-estimating baseline emissions in countries with a large share of CDM projects.

The quality of input data in calculating the grid emission factor is also important. In analysing grid emission factors provided by different DNAs, Michaelowa (2011) finds “that most of the documents provided by the DNAs do not allow an external observer to judge whether the data has been collected correctly” and that “there are clear indications that the grid emission factors, as well as the coal power plant benchmarks, have been overestimated both in China and India.” In some countries, the governments established grid emission factors, and DOEs apparently used the values without validating whether they comply with the methodological requirements under the CDM. In order to address this issue, Michaelowa (2011) recommends, inter alia, an “independent validation of grid EF”. Recently, few grid emission factors are submitted as standardized baselines which ensures independent validation by a DOE or the UNFCCC secretariat.

Furthermore, the tool provides several default values for parameters such as the electric efficiency of power plants. The values provided can be considered quite conservative, i.e. they assume rather high electric efficiencies. For those countries using the default values, this may lead to an under-estimation of baseline emissions.

generation is available. However, some countries do not only have run-of-river hydro power plants (for which case, the assumption of spilling water may be reasonable), but water may also be stored in large reservoirs and thus used at a later stage. In this regard, the estimation of baseline grid emissions for countries with a large share of low-cost/must-run power plants can be considered conservative, i.e. tending to under-estimate baseline emissions. However, it has to be noted that less than 5% of CDM projects used this approach for estimating the grid emission factor.

⁵⁹ E.g. assuming that there would be a significant increase of coal-fired power generation without straightforward evidence.

⁶⁰ For example, trends in a changing composition of the electricity grid or the grid emission factor observed in recent years could be considered and extrapolated for future years. Similar approaches are used in a number of other CDM methodologies.

The overall emissions impact of wind power plants also depends on other factors. Firstly, the upstream emissions from wind power, such as for construction, are relatively low (about 10 g CO₂e/kWh (IPCC 2014)); for most countries they are likely to be lower than upstream emissions from fossil fuel use displaced in grid power plants. Ignoring upstream emissions is therefore a conservative assumption. Secondly, an increasing uptake of wind power plants due to the CDM may lead to decreasing costs for wind power generation, which in turn could contribute to a higher uptake of wind power. This positive spillover effect is, however, difficult to estimate, in particular with regard to any emissions outcome. Thirdly, the length of the crediting period may lead to under-crediting if wind power plants are operated longer than the crediting periods.⁶¹ However, many wind power plants are expected to operate for about 20 years and about three quarter of wind power projects have selected a renewable crediting period of up to 21 years. Further aspects of potential over- and underestimation of baseline emissions are described in (Erickson et al. 2014).

Overall, we conclude that the current approach for estimating emission reductions from CDM wind projects is largely suitable. Methodological assumptions lead to both over- and under-estimation of emission reductions but can be considered appropriate for estimating baseline emissions of CDM wind projects.

4.5.5. Other issues

No other issues were identified.

4.5.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenue has only a limited impact on profitability of wind power plants • Support schemes often exist and are a main driver for wind power development • Investment costs have decreased significantly in recent years, making wind power in some cases competitive with fossil generation (LCOE) • Wind power is already widely used in large CDM countries (e.g. China, India)
Over-crediting	<ul style="list-style-type: none"> • Methodological assumptions may lead to both over- and under-crediting; no clear-cut conclusion on whether over- or under-crediting occurs overall
Other issues	<ul style="list-style-type: none"> • None

4.5.7. Recommendations for reform of CDM rules

Due to our finding of an overall questionable additionality of wind power projects, we recommend that this project type is generally no longer eligible for new projects under the CDM. As an exception to this rule, countries with significant technological and cost barriers⁶² may be allowed to further use the CDM for implementing wind power plants.

With regard to the estimation of baseline emissions, we recommend the following:

- The CDM EB should ensure that grid emission factors are always verified by designated operational entities (DOEs);

⁶¹ For a discussion of the effects of the crediting period, refer to Section 3.5.

⁶² Such as transaction costs, e.g. due to the non-availability of technical knowledge in the country, or risk premiums in low-income countries. Least-developed countries could, for instance, be included in the list of eligible countries. Furthermore, the market share of wind power could be used to establish eligibility since it could be considered an indicator for barriers in the country.

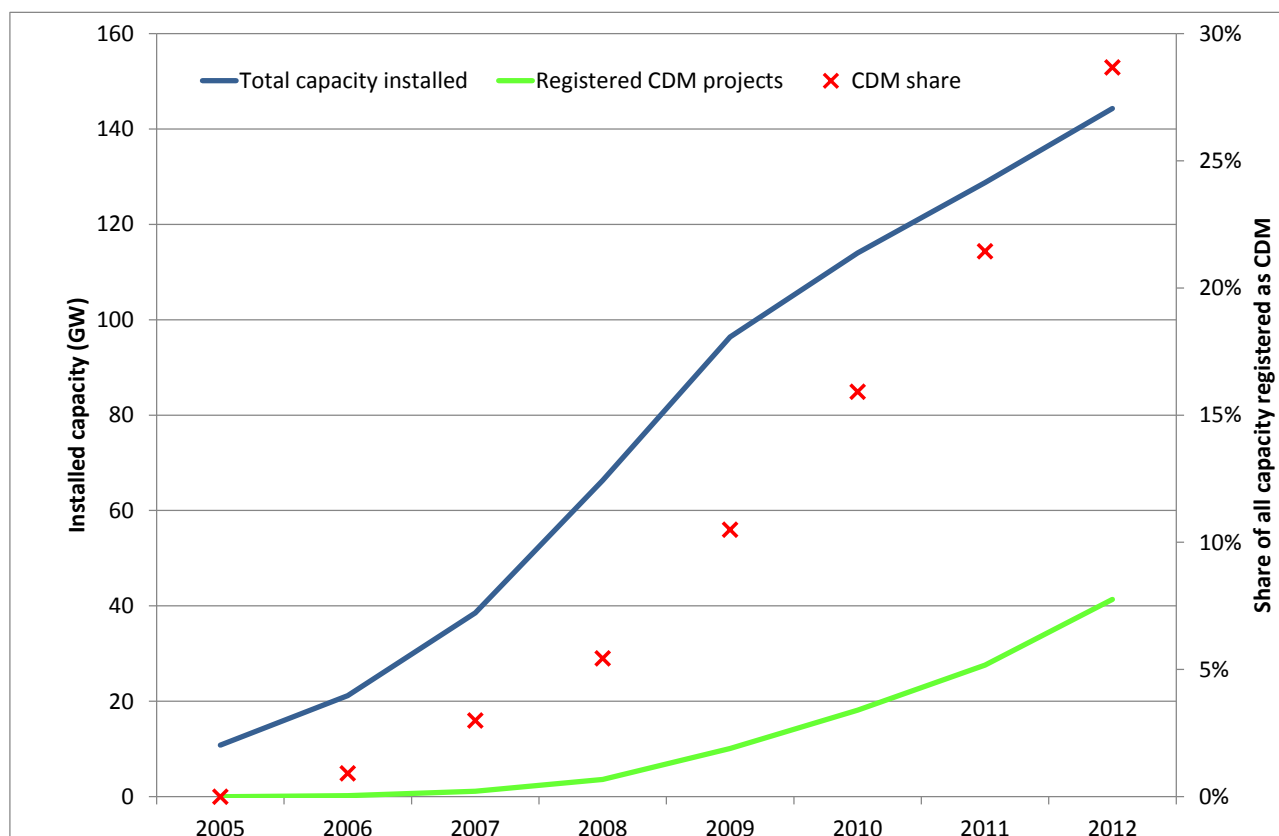
- The provisions for low-cost/must-run plants should be reviewed, including a clear definition of such plants and provisions which ensure that such plants are included in the operating margin if they are at the margin of the dispatch at any time;
- The grid emission factor tool should be revised to reflect trends in the composition of the power sector over time.

4.6. Hydropower

4.6.1. Overview

CDM hydropower projects mainly use two methodologies.⁶³ According to the UNEP DTU (2014), by the end of 2013, an overall hydropower capacity of 92 GW had been installed by projects using the CDM. The main contributors to this overall capacity are China (58 GW), Brazil (12 GW), followed by Vietnam and India (6 GW each). The other 44 countries with CDM hydropower projects account for 11 GW of installed capacity in total.

Figure 4-5: Total cumulated hydropower capacity installed in China between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

As for wind power, Figure 4-5, Figure 4-6 and Figure 4-7⁶⁴ illustrate the development of hydropower capacity and the use of the CDM in China, India and Brazil. In all three countries, hydropower has played an important role for many decades. Significant capacity has been installed without the CDM. Hydropower may therefore be considered common practice in all three countries.

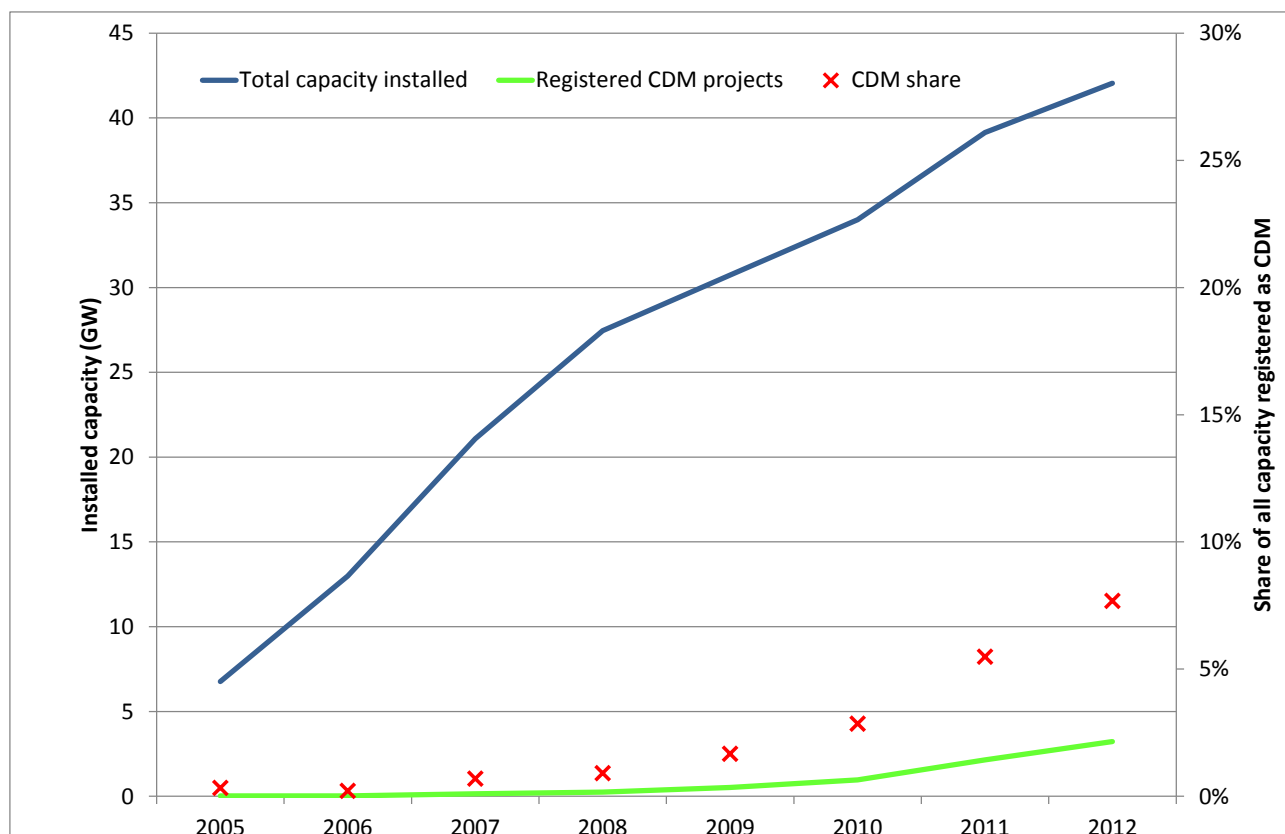
⁶³ ACM0002, AMS-I.D.

⁶⁴ Cf. footnote 51.

In China, the cumulated installed capacity in 1990 amounted to approx. 25 GW. A comparison of total hydro capacity installed and the capacity installed by projects using the CDM⁶⁵ over the 2005-2012 period (Figure 4-5) shows that there were no CDM projects until 2005, even though capacity additions in that year amounted to 11 GW. As of 2012, the share of CDM projects was 29% of total installed capacity.

In the case of India (Figure 4-6), the cumulated installed capacity in 1990 amounted to approx. 19 GW. Almost 7 GW of capacity was added in 2005 alone, with the CDM covering only a negligible share. After the introduction of the CDM, only a small share of hydropower projects used the CDM, with the CDM accounting for about 8% of total cumulated installed capacity⁶⁶ as of 2012.

Figure 4-6: Total cumulated hydropower capacity installed in India between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

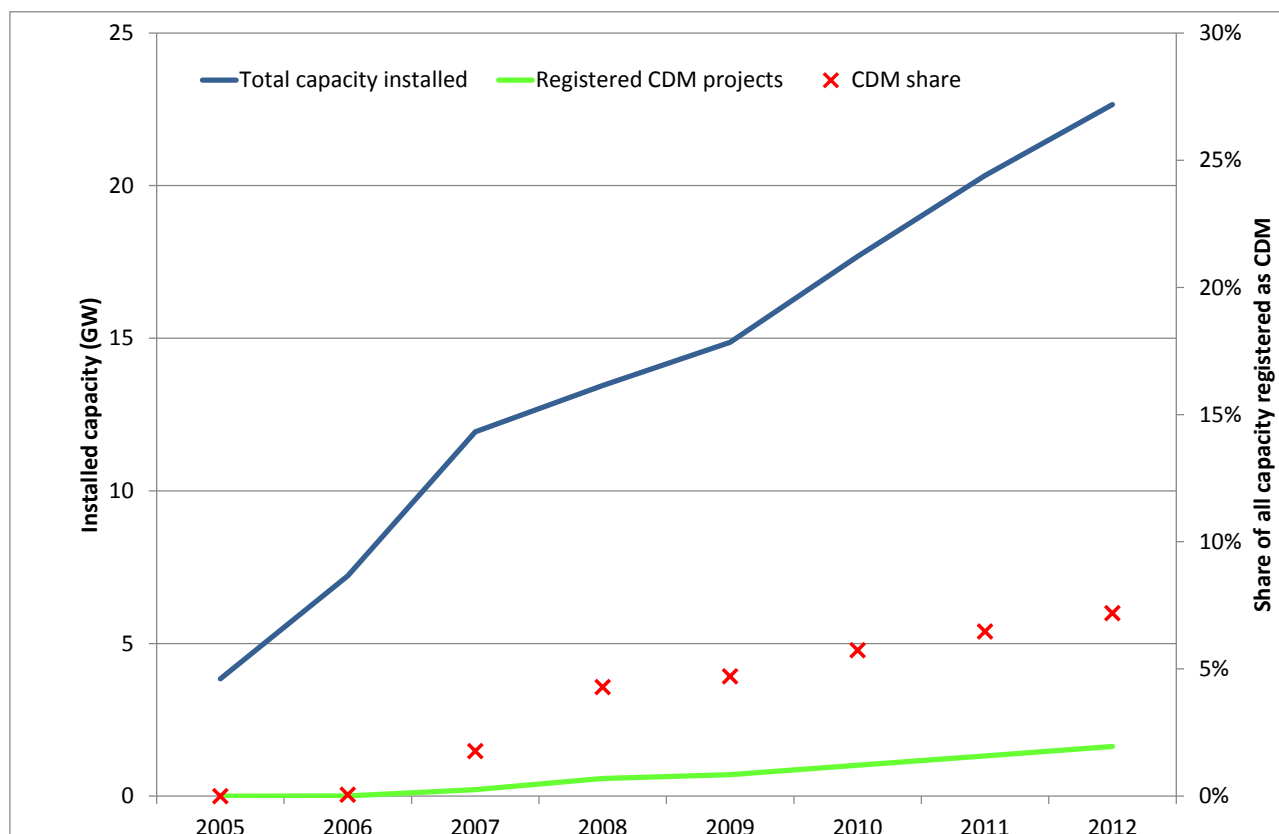
In the case of Brazil (Figure 4-7), the cumulated installed capacity in 1990 amounted to approx. 53 GW. Almost 4 GW of capacity was added in 2005, with no CDM projects being registered in that year. Even after the introduction of the CDM, only a small share of hydropower projects used the CDM (approx. 7% of total cumulated installed capacity⁶⁷ as of 2012).

⁶⁵ The total installed capacity between 2005 and 2012 is taken from the Platts database and accumulated across the years. The installed capacity of projects using the CDM is taken from the UNEP DTU (2014) and accumulated, too. The installation year is taken as the starting date of the crediting period. See Section 4.5 for the rationale of using cumulative data.

⁶⁶ Between 2005 and 2012.

⁶⁷ Between 2005 and 2012.

Figure 4-7: Total cumulated hydropower capacity installed in Brazil between 2005 and 2012



Sources: UNEP DTU 2014, Platts 2014, authors' own calculations

4.6.2. Potential CER volume

According to our own estimates, registered CDM hydropower projects have the potential to issue 4.2 billion CERs by the end of their respective crediting periods, of which 1.7 billion CERs fall in the 2013-2020 period (Table 2-1). CERs from hydropower account for approx. 30% of the total CER issuance potential.

4.6.3. Additionality

Generally, the same methodologies and additionality rules apply as for wind power (Section 4.5.2). Hydropower CDM projects primarily use investment analysis to demonstrate additionality.

The analysis in Section 4.6.1 demonstrates that hydropower plants have been constructed for a long time in many countries, which suggests that the technology may be regarded as common practice in many countries. In many cases, especially large hydropower plants were established without subsidies, which is demonstrated by the uptake of hydropower many years ago (Section 4.6.1). In the case of small hydropower (SHP) plants in China, Bogner & Schneider (2011) find that “apparently, smaller SHP plants face stronger barriers despite the government’s commitment to SHP development” and that “an especially remote location, an inappropriate feed-in tariff or banks that deny loans can be possible barriers”. Therefore, they conclude that “the CDM may have played a certain role for some SHP project developments” (ibid.). However, they argue that “investment in SHP stations between 20 and 50 MW appear more feasible without the CDM” (ibid.). Moreover, according to their analysis “medium and large hydropower has witnessed considerable growth a long time before the CDM even existed, which makes it difficult to justify that new projects

can only be implemented with the help of the CDM. In conclusion, our analysis suggests that the CDM is for most projects not an important factor for investment decisions in the medium and large hydropower plants. It appears likely that most projects would have been implemented in any case, i.e. without the CDM”.

The impact of CER revenues on profitability is, at three to four percentage points, somewhat larger than for wind power (Section 2.4), mostly due to a higher plant utilization than for wind power. However, the increase in profitability due to CDM revenues is still relatively small compared to other project types⁶⁸. Also, in many cases, hydropower generally features competitive levelized costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013).

Overall, due to the fact that hydropower is common practice in many countries, the limited impact of CER revenues on the profitability of hydropower plants and the competitiveness of hydropower with fossil electricity generation in many cases, we consider additionality of hydropower projects as questionable in the context of the CDM, especially for large hydropower.

4.6.4. Baseline emissions

Hydropower projects largely use the same methodological approaches for baseline emissions as wind power plants, and hence the same conclusions apply with regard to different aspects of over- or under-crediting. Few differences should be noted with regard to the emission impacts: Hydropower projects have, on average, somewhat higher upstream emissions for their construction (approx. 20 g CO₂e/kWh related to the “infrastructure & supply chain emissions” according to (IPCC 2014)), which, however, are still lower than typical upstream emissions from fossil use in the baseline. Thus, ignoring upstream emissions is still conservative. More importantly, the lifetime of hydropower can be significantly longer than the maximum crediting period under the CDM (21 years), which adds to the conservatism of the estimation of emission reductions for hydropower plants. In this regard, over the plants' lifetime, overall emission reductions may be rather under-estimated than over-estimated.

4.6.5. Other issues

In addition to baseline emissions, project CH₄ emissions ensuing from hydro reservoirs are considered under the CDM. The ACM0002 methodology uses the power density, which is defined as the installed hydro capacity divided by the reservoir surface, as an indicator of whether CH₄ emissions from reservoirs need to be considered. CDM projects with a power density below 4 W / m² are not eligible and projects with a power density between 4 and 10 W / m² have to estimate methane emissions, using a default emission factor of 90 g CO₂e/kWh. According to (IPCC 2014), methane emissions from “currently commercially available technologies” amount to 88 g CO₂e/kWh, however, the bandwidth is quite large. However, according to (Fearnside 2015), the default emission factor of 90 g CO₂e/kWh refers “only to bubbling and diffusion from the reservoir surface and” is an underestimate “of hydropower impact because these values ignore the main sources of methane release: the turbines and spillways”. Overall, he finds that “tropical hydroelectric dams themselves emit more greenhouse gases than are recognized in CDM procedures”. It can therefore be concluded that the current methodological rules under the CDM may lead to a potential underestimation of methane emissions from hydropower.

⁶⁸ It has to be noted, however, that the range of operating hours and investment costs of hydro power plants depends quite strongly on plant-specific conditions, for which reason the contribution of the CDM to overall profitability may be higher in some cases and lower in others.

4.6.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Common practice in many countries • CERs have only a moderate impact on profitability • In many cases competitive with fossil generation (LCOE)
Over-crediting	<ul style="list-style-type: none"> • Methodological assumptions may lead to both over- and under-crediting; over the lifetime of the project, emission reductions are likely to be underestimated
Other issues	<ul style="list-style-type: none"> • Potentially significant methane emissions from reservoirs which may not be fully reflected by CDM methodologies

4.6.7. Recommendations for reform of CDM rules

We recommend excluding large scale hydropower projects from being eligible under the CDM, due to the overall questionable additionality. A similar recommendation is made by (Erickson et al. 2014), who, in an analysis of the net mitigation impact of the CDM conclude “that excluding large scale power supply projects from the CDM could help increase the net mitigation impact of the CDM, as well as steer investment towards projects that are truly dependent on CER revenues”. We recommend that small-scale hydropower projects with significant technological or cost barriers⁶⁹ may be allowed under the CDM.

With regard to the estimation of baseline emissions, our recommendations for wind power plants (Section 4.5.7) also apply here. In addition, the provisions with regard to the estimation of methane emission from hydropower should be revised to address the potentially significant magnitude of these emissions.

4.7. Biomass power

4.7.1. Overview

CDM biomass power projects mainly use four methodologies.⁷⁰ According to the UNEP DTU (2014), by the end of 2013, an overall biomass energy⁷¹ capacity of 8.5 GW was installed by projects using the CDM. The main contributors to this overall capacity are China (3.7 GW) and India (2.1 GW), followed by Brazil (0.9 GW). The other 36 countries with CDM biomass projects account for 1.8 GW of installed capacity in total.

Generally, data availability is not sufficient to judge the magnitude of biomass capacity installed prior to the introduction of the CDM. Moreover, due to inconsistencies in the data, no meaningful comparisons can be made between projects installed with and without the use of the CDM.

4.7.2. Potential CER volume

According to our own estimates, all registered CDM biomass power projects have the potential to issue 0.36 billion CERs by the end of their respective crediting periods, of which 0.16 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from biomass power account for about 3% of the total CER issuance potential.

⁶⁹ The criteria need to be further specified. See also footnote 62.

⁷⁰ ACM0006, AM0015, AMS-I.C, AMS-I.D. It has to be noted, however, that the AM0015 methodology was only used for CDM projects registered in the early phase of the CDM.

⁷¹ Including different energy forms from biogenic sources.

4.7.3. Additionality

For large-scale projects (according to ACM0006), the identification of the baseline scenario and the demonstration of additionality are conducted in parallel.⁷²

With regard to the investment analysis, due to the diversity of project types, no overall conclusions can be drawn. Also, analysis available in the literature is quite limited, in contrast to wind and hydropower. On average, the impact of CER revenues on the profitability of projects is with about eight percentage points considerably larger than for wind or hydropower plants, making additionality claims more plausible (Section 2.4). The profitability of projects without CER revenues is, with an average IRR of approx. 5%, also lower than for wind (approx. 7%) and hydro (approx. 8%). The higher impact of the CDM is mostly due to the claiming of avoided methane emissions in many projects, which significantly improves the profitability of CDM biomass projects.

The investment analysis, which is applied by many projects, involves considerable uncertainty due to the variability of the biomass price, which strongly affects the profitability of biomass plants. In addition, many countries have set up domestic support schemes in order to promote the increased use of renewables, including ones for biomass power generation. In addition, biomass power is not a completely new technology, but is rather based on the technology of thermal power plants in general and has been used extensively in some industries and countries before (e.g. in the sugar cane industry in Brazil), which indicates that the technology has been profitable in the past in some instances. This is underpinned by the fact that biomass power features competitive levelized costs of electricity in comparison to new fossil-fired power plants (IRENA 2015; ISE 2013).

Only a few scholars explicitly deal with the additionality of CDM biomass power projects. Stua (2013) finds that, in the case of China, the national feed-in tariff made “most of the biomass-fuelled power plants [cost-competitive] against [...] coal-fired plants”.

Overall, based on the information presented above, we cannot clearly conclude on the likelihood of the additionality of biomass power plants.

4.7.4. Baseline emissions

As outlined in Section 4.7.2, the identification of the baseline scenario and the demonstration of additionality are conducted in parallel, considering a wealth of different options.

One key requirement in methodologies for using biomass residues is that the biomass residues would not be used in the absence of the project and would be left to decay (sometimes aerobically, sometimes anaerobically also claiming CH₄ baseline emissions). This requirement is appropriate and important due to potential competing uses for the biomass. If the biomass residues were used in the absence of the project for other purposes, there may be no emission reductions, since the diversion of biomass from one use to another due to the CDM may lead to increased emissions elsewhere. If CDM projects only divert the use of biomass residues but do not result in more biomass residues being collected which would otherwise decay, this may also lead to indirect land-use change, i.e. due to the increased use of biomass (residues), previous demand may be covered by drawing on biomass from other areas, thus leading to decreasing carbon stocks there.

Methodologies vary with regard to how they assess that the biomass residues are indeed ‘available in abundance’ and that decay is a likely scenario. In older versions, the abundance of biomass residues had to be monitored annually, while in newer versions this is only checked once at the project start and at the renewal of the crediting period.

⁷² For small-scale biomass projects, the same additionality rules as for wind power apply (Section 4.5.2).

In general terms, there is an increasing demand of biomass for different uses (food, raw materials, energy) worldwide. This means that biomass residues (in many cases) either already have or will likely have a price in the future. As a consequence, the demonstration that biomass residues would otherwise be (completely) left to decay needs to take current market developments into account. For this reason, a regular checking of the abundance of biomass residues through monitoring may be more appropriate than a simple check once at the project start.

Furthermore, in many cases, anaerobic decay of biomass is claimed by project developers. However, this assumption may be contested depending on the circumstances. For instance, if biomass waste is spread on fields, biomass decay is rather aerobic than anaerobic, thus producing little or no methane emissions. In many instances, the amount of methane emissions claimed appears very large; it may be questionable whether truly anaerobic conditions prevail in the typical circumstances in which biomass residues are left to decay. We therefore conclude that the current approach of demonstrating the abundance of biomass residues may lead to a risk of over-crediting as no adequate monitoring of availability of biomass residues is in place. In addition, exaggerated claims of anaerobic decay of biomass may lead to further over-crediting.

With regard to the baseline emissions from displacing power plants in the grid, the same conclusions apply as discussed in Section 4.5.4.

4.7.5. Other issues

No other issues were identified.

4.7.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Significant impact of CER revenues on plant profitability due to claims of methane emission reductions • In many cases competitive with fossil generation (LCOE) • Support schemes exist
Over-crediting	<ul style="list-style-type: none"> • Demonstration that biomass is left to decay or available in abundance is only conducted once at the start of the project activity • Risk of exaggerated claims of anaerobic decay
Other issues	<ul style="list-style-type: none"> • None

4.7.7. Recommendations for reform of CDM rules

Due to our finding that the demonstration of abundance of biomass as well as of the claim that biomass is left to decay (under potentially anaerobic conditions) is key for avoiding any over-crediting of emissions, it is recommended that corresponding provisions in the applicable methodologies are reviewed, with a view to ensuring that this demonstration considers current trends of biomass use and disposal and that any claims for anaerobic conditions of biomass decay are realistic. In particular, the monitoring of biomass abundance should be carried out more frequently (e.g. annually).

4.8. Landfill gas

4.8.1. Overview

Decomposition of solid waste in landfills generates carbon dioxide (CO₂) and methane (CH₄). This landfill gas can be captured and flared or captured and utilised for electricity production or as a fuel. GHG emission reductions are achieved through the destruction of methane, and in the case of

energy production, displacement of a more GHG-intensive energy source. Global estimates suggest that 50 Mt of methane are generated annually from landfills (IPCC 2014).

The composition of landfill gas is usually approx. 50% CO₂ and 50% CH₄ (Hoornweg & Bhada-Tata 2012; US EPA 2013). It varies by climate and waste composition. In general, methane generation increases in wetter versus arid climates and warmer versus cooler climates. Warmer climates increase the growth of methane-producing bacteria (US EPA 2013). Waste composition with a higher percentage of organic material generates more methane and degrades more quickly (US EPA 2013). Waste in lower income countries often includes a higher percentage of organic material than higher income countries (Hoornweg & Bhada-Tata 2012).

4.8.2. Potential CER volume

The potential to capture landfill gas varies by landfill management type. Gas collection rates can be as high as 75% for basic landfills in which waste is compacted and covered and up to 85 - 95% for engineered sanitary landfills whereby landfills are lined or capped to prevent leakage or contamination from the waste (US EPA 2013). Landfill management practices vary by region. While the majority of landfills in developed countries are engineered landfills, in developing countries mitigation opportunities are more limited because the majority of landfills are basic landfills or open dumps (US EPA 2013). In open dumpsites, decomposition is predominantly aerobic; as a result methane generation rates are relatively low and gas recovery rates are limited (~10%) (US EPA 2013). Because there is often a high concentration of food waste and wet condition in developing country sites, waste decays quickly and the methane gas is released quickly. As a result, mitigation activities to capture methane must be implemented on active open dumpsites, since after a lag of even 1-2 years most of the methane will have already been generated⁷³ (US EPA et al. 2012).

There are two primary landfill gas methodologies under the CDM. ACM0001 is the consolidated large-scale methodology and AMS-III.G is the small-scale methodology. As of 1 July 2015, there were 364 registered landfill gas projects. Predominantly these are large-scale projects located in Latin America and Asia/Pacific regions, though there are also projects in Africa, Europe/Central Asia and the Middle East. Of the 364, 149 projects have issued a total of 69 million CERs. As of 1 August 2015, the average issuance success rate amounted to 58% (UNEP DTU 2015a).

4.8.3. Additionality

Prior to 2013, large-scale landfill gas projects assessed additionality according to the CDM "Combined tool to identify the baseline scenario and demonstrate additionality". This tool, similar to the CDM 'additionality tool' requires that projects demonstrate that they are additional based on either an investment or a barrier analysis, complemented by a common practice analysis. Similarly, prior to 2014, small-scale projects applied the general guidelines or tool for small-scale activities. Most projects used investment analysis to demonstrate additionality, predominantly benchmark analysis or simple cost analysis (IGES 2014, similar to earlier results from Spalding-Fecher et al. 2012).

A standardized approach to additionality assessment was incorporated into Version 15 of ACM0001, eligible as of 8 November 2013, and version 9 of AMS-III.G, eligible as of 28 November 2014. This revision established a positive list for additionality of landfill gas projects. All landfill gas projects are automatically considered additional if prior to the implementation of the project they only vented or flared methane, and if under the project activity they either flare the methane, or use methane to generate heat, or use the methane to generate power with a capacity of less than 10 MW. As of 1 May 2014, only one landfill gas project had been registered using this methodology

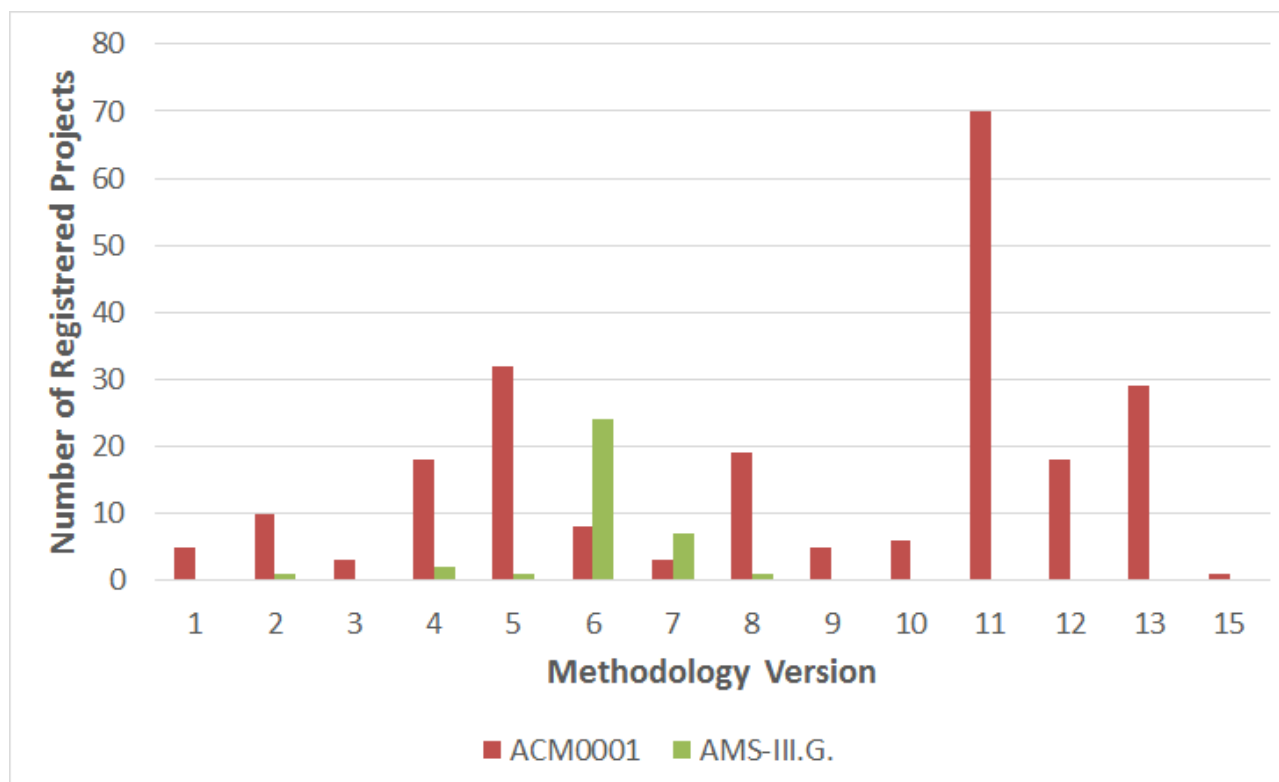
⁷³ While not applicable for the landfill gas methodology (ACM0001), the rapid decay rates may have implications on the applicability of the first order decay model used in the CDM "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" and included in the avoided landfilling via composting methodologies.

Version 15, as shown in Figure 4-8. The CDM EB will review the validity of these standardized procedures after a three-year time period.

CDM projects can only claim emission reductions for methane capture that exceeds any applicable regulations. In regions in which a regulation is in place but it can be demonstrated that it is not enforced, projects can still claim emission reductions for implementing the regulation. This has raised concerns that enforcement may be discouraged by constituencies receiving CER revenues. One such example is in the Philippines, where regulation has been established requiring gas capture and destruction, but it has not been enforced. Concerns have been raised that CER revenue has led to a pressure to discourage enforcement (Docena 2010).

Projects that capture and flare methane have no independent revenue source (US EPA et al. 2012). Flaring projects are therefore very likely to be additional. For projects using landfill gas for energy generation, additionality seems likely. As shown in Section 2.4, the available data from CDM projects indicates that the IRR is rather low without CER revenues (approx. 2.5-2.8% on average) but increase substantially with CER revenues (to approx. 16.6-18% on average). Indeed, collection and flaring of landfill gas is not common practice in developing countries without carbon finance, though it may be possible to implement projects economically where there are renewable portfolio standards (RPS) or feed-in tariffs, to allow energy production revenue to cover costs and provide capital investment for methane collection systems. For projects that supply heat, electricity, or methane to natural gas pipelines, the price and revenue from energy generation are a primary driver of the economics of the project. With economies of scale, the larger the landfill gas project, the more energy can be generated and the more likely the project is profitable.

Overall there are no substantial concerns with the approach to assess additionality for large- and small-scale landfill gas projects. The primary lingering concern is the potential for CDM projects to discourage the implementation of regulations that require capture and destruction of landfill gas.

Figure 4-8: Number of registered landfill gas projects by methodology

Source: IGES 2014

4.8.4. Baseline emissions

The baseline scenario for ACM0001 and AMS-III.G is assumed to be the atmospheric release of methane, unless capture and flaring is required by regulation or unless capture occurred to some extent prior to the implementation of the project. Baseline emissions are determined based on the amount of methane flared or used under the project activity (less any methane gas that was flared under the baseline). The overall volume of emission reductions generated is based on the baseline emissions minus any combustion efficiency losses and minus any methane that would have been destroyed under the baseline via soil oxidation. ACM0001 considers four different cases for how to account for regulation and existing landfill gas capture systems. These include no regulation/no existing capture system, no regulation with existing capture, regulation without existing capture, and regulation with existing capture. The small-scale methodology uses, in principle, the same approach but is less specific; the baseline emissions must take into account the volume of landfill gas required to be collected by regulation and the presence of pre-existing landfill gas collection and combustion systems. The overall approach of estimating the baseline emissions based on the amount of captured gas seems reasonable. However, there are concerns related to the default assumptions for pre-existing systems and regulations, and the accounting for soil oxidation.

If a regulation requires the collection of landfill gas or if a landfill gas collection system was pre-existing, but the regulation does not specify the amount to be collected or the historical amount collected is not known precisely, then both methodologies assume that 20% of the amount captured under the project scenario would be captured in the baseline. The methodology explains that this default value is based on assumptions that the capture efficiency of the project system is 50% and under the baseline 20%, and that in the baseline the methane was flared using an open flare with an efficiency of 50%. Despite the explanation, it remains unclear how the overall default value

of 20% of project emissions is derived. While a 50% destruction efficiency for an open flare is conservative when considering project emissions, used in the context of baseline emissions it has the potential to actually overestimate the emission reductions. The methodologies implicitly assume that the CDM project captures five times the amount of methane than would be captured under a regulation. This assumption seems rather optimistic and likely leads to a significant over-estimation of emission reductions.

There are two types of soil oxidation that can occur at a landfill. Top-layer soil oxidation refers to soil oxidation under baseline conditions when methane oxidizes as it passes through the top layers of the landfill. The second type of oxidation can occur when additional air is introduced into the landfill due to suction from the LFG capture system under the project scenario.

Early versions of ACM0001 and AMS-III.G did not account for these two effects. This likely led to an overestimation of baseline emissions for projects that were registered up to version 11 of ACM0001 (valid until 25 July 2012) and up to version 7 of AMS-III.G (valid for registrations until 28 May 2013). This shortcoming was recognised and, in principle, addressed from version 12 of ACM0001 and version 8 of AMS-III.G onwards, by introducing a default factor for the amount of methane that would oxidize in the baseline, using 10% for “managed solid waste disposal sites that are covered with oxidizing material such as soil or compost” and 0 “for other types of solid waste disposal sites”.

Concerns have been raised about the default values applied for the soil oxidation factor. Methane oxidation in covered landfills occurs mainly through bacterial degradation, primarily by methanotroph bacteria, resulting in production of carbon dioxide, water, and biomass. The rate of oxidation is influenced by a variety of physical factors, including different soil cover types (Chanton et al. 2009). Methane oxidation generally increases with temperature up to around 40°C and is also influenced by moisture, where either too dry or too wet conditions can inhibit methane oxidation (Chanton et al. 2009; Spokas & Bogner 2011). Soil oxidation further depends on the type of soil cover and the thickness of soil cover. Higher soil oxidation rates occur in landfills that are well managed with a thick soil cover. In a study of landfills with similar operational characteristics in different climate zones of the United States, methane oxidation was lowest in humid subtropical regions and highest in arid regions (Chanton et al. 2011). This research suggests that for poorly managed landfills in humid sub-tropical and tropical regions the soil oxidation rates may be very low.

The IPCC sets default values for landfill cover methane oxidation are typically between 0% and 10% of generated CH₄ (IPCC 2006), possibly derived from one early study of a New Hampshire landfill. The 2006 IPCC Guidelines for National Greenhouse Gas Inventories indicate that:

“The use of the oxidation value of 10% is justified for covered, well-managed solid waste disposal sites to estimate both diffusion through the cap and escape by cracks/fissures. The use of an oxidation value higher than 10%, should be clearly documented, referenced and supported by data relevant to national circumstances.”

This highlights that the 2006 IPCC Guidelines consider a soil oxidation value of 10% as justified only for covered and well-managed sites. However, more recent literature surveys and experimental studies indicate that oxidation rates for covered landfills are higher, amounting on average to approx. 30% (Chanton et al. 2009; Chanton et al. 2011), although the 2009 paper indicates that the data may over-represent warmer conditions when oxidation rates would be higher.

Some stakeholders have raised concerns that the soil oxidation factor was not adjusted upwards in the CDM methodologies when more recent research indicated that an average value of 30% may be more representative (Chanton et al. 2009). However, the higher soil oxidation rates reported by

(Chanton et al. 2009) may not be fully appropriate for the context of developing countries, given that both an intermediate and final cap would have to be in place to a certain engineering standard. In most developing countries, landfills are rarely well managed with a thick soil cover required for this level of soil oxidation. This suggests that the higher soil oxidation rates may not be applicable to the conditions for some CDM projects. Nevertheless, having a default factor for both managed and unmanaged landfills avoids creating a disincentive for covering and managing landfills. The use of the soil oxidation rates as a standard default for all projects runs the risk of underestimating the volume of credits generated in some sub-tropical and tropical regions with unmanaged landfills for which soil oxidation rates under the baseline would have been very low or zero.

4.8.5. Other issues

Stakeholders have commented in public submissions to the UNFCCC with regard to revisions of ACM0001 that different types of perverse incentives can arise from landfill gas projects. Two main perverse incentives can be of concern, which both lead to an over-estimation of emission reductions.

Firstly, project developers can have an incentive to store the waste in a manner that generates more methane. For example, a 'flat' landfill with low methane generation potential could be changed to store waste at a greater height. Moreover, project proponents can have an incentive to maximise methane generation through other means, such as pulling water in the landfill to create anaerobic conditions. On a site visit to a landfill gas project in China in 2005, engineers proudly explained how they had found a way to generate more methane by stacking waste higher in one section of the landfill rather than spreading it evenly across the landfill site. While this is just one anecdotal example, there is reason to believe that some landfill projects may be altering management practices to do so. Based on these observations, in 2012 more recent versions of both the large- (version 13.0) and small-scale methodologies (version 8.0) included an applicability criterion that excludes projects in which the management is changed in order to increase methane generation. However, verifying this requirement may be difficult in practice and it has not been included as an explicit provision for DOEs to assess after the project implementation.

Secondly, there could be perverse incentives for policy makers and private actors not to engage in recycling or other ways of preventing waste generation, as this could lower the potential for CDM landfill gas projects. Similarly, there could also be perverse incentives to continue landfilling instead of introducing other waste treatment methods (incineration, composting).

Public comments received on behalf of waste picker organizations have raised concerns that development of a project limits access of waste pickers who, through the informal economy, contribute significantly to the recycling of materials (Global Alliance for Incinerator Alternatives, GAIA). Project developers who were interviewed acknowledged that sites need to be secured for project installation, to avoid having equipment tampered with or material stolen. For certain projects, including examples in Latin America and Thailand, agreements have been made for waste pickers to pick through waste before it is transferred into the secure site. However, in other cases there has not been any cooperation between the project developers and waste pickers, which has resulted in conflict and loss of livelihoods. There is evidence that the development of landfill gas projects is limiting the access of waste pickers and thereby reducing the reuse and recycling of waste through the informal economy. Given the success of collaborative agreements with waste pickers, this may be a model which new projects should be required to incorporate.

Pursuing landfilling instead of other waste treatment methods, such as recycling, incineration or composting, is likely to result in overall higher GHG emissions, even if the landfill gas is captured, because landfill gas collection systems are not able to capture all of the methane. The CDM may thus provide perverse incentives for policy makers or project owners to continue pursuing a waste

treatment method that is more GHG-intensive. If in the absence of the CDM, other waste treatment methods would be pursued, it would lead to an over-estimation of emission reductions.

Early versions of CDM methodologies did not include any provisions to address this issue. Regarding the potential perverse incentive to reduce recycling, starting with version 12 of ACM0001, an applicability criterion requires that “the implementation of the project activity does not reduce the amount of organic waste that would be recycled in the absence of the project activity”. However, there is no reference to how this should be assessed. Moreover, this applicability condition does not address the broader concern that the CDM provides incentives to continue pursuing landfilling and not composting or waste incineration. In public comments submitted by non-governmental organisations, such as the GAIA, there have been calls for eligibility requirements that would allow projects only on closed landfills in order to prevent the potential for this perverse incentive of reducing recycling and composting. Project developers argued that in developing country contexts, with warmer climates and higher percentage of organics in the waste stream, the capture of methane must take place while the landfill is actively being used, otherwise the methane will have already been released once it is closed. This is in contrast to landfills in more temperate climates, where methane production happens more slowly and where it is more common to develop a project at a closed landfill.

Overall, there is reason to believe that landfill gas projects are contributing to perverse incentives to manage landfills in ways that generate more methane and to reduce reuse and recycling or avoid a shift towards composting or waste incineration. In addition, it appears there are cases in which project participants increase methane production – an issue which may deserve particular attention in the validation and verification auditing processes.

4.8.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Likely to be additional
Over-crediting	<ul style="list-style-type: none"> • Default assumptions for the rate of methane captured under pre-existing collection systems or regulations are unjustified and have the potential to overestimate emission reductions • Default soil oxidation rates may underestimate emission reductions for uncovered landfills in humid sub-tropical and tropical regions with very low soil oxidation rates; nevertheless, requiring the use of a default soil oxidation rate for baseline emissions avoids creating a perverse incentive to avoid covering landfills • Potential for perverse incentives for policy makers not to regulate landfills or enforcing regulations in place • Perverse incentives for project developers to manage landfills in ways that increase methane generation
Other issues	<ul style="list-style-type: none"> • Perverse incentives for policy makers not to pursue less GHG-intensive waste treatment methods, such as composting or incineration • Some landfill gas projects exclude waste pickers and informal sector recycling, reducing overall rates of reuse and recycling

4.8.7. Recommendations for reform of CDM rules

We recommend several revisions to the CDM landfill gas methodologies to address the potential over-crediting, in particular the perverse incentives for both project owners and policy makers:

- Instead of applying one value for the soil oxidation factor to all projects, different values could be applied to different regions based on the climatic conditions and practices in that region.

- The approach of the default factors used for estimating methane capture from pre-existing collection system or landfills with regulations should be revisited. Assumptions in the default factor could be revised to be more conservative by assuming that more (rather than less) methane was captured and destroyed.
- Include specific requirements for DOEs to verify that the landfilling practice was not changed with a view to generating more methane.
- To avoid the reduction in recycling by excluding waste pickers access to the site, the methodology could be revised to be more specific about how projects should provide waste pickers with access to solid waste before it is deposited in the secure dumpsite.
- Given the long-term need to transition away from landfilling and increase composting and recycling, there could be a sunset clause considered for CDM landfill projects.

4.9. Coal mine methane

4.9.1. Overview

Methane is stored within coal as part of the coal formation process. During coal mining activities some of the methane is released. The build-up of methane in coal mines creates a potential explosive hazard and efforts before, during, and after mining are taken to reduce the safety risk by releasing methane into the atmosphere. Methane released from coal mines makes up approx. 8% of global anthropogenic methane emissions (Global Methane Initiative 2011). Methane originating in coal seams that is drained prior to mining is known as coal bed methane (CBM). Through a process of pre-mining drainage, this methane can be extracted to reduce the safety risk. During coal mining, methane can be vented from coal mines, which is known as ventilation air methane (VAM). After mining has ceased, methane can be extracted, which is known as post mining or post drainage coal mine methane (CMM). Coal mine methane projects involve installation of control technologies to collect and destroy and/or utilise methane from existing and abandoned mines, instead of releasing it to the atmosphere. Under the ACM0008 methodology of the CDM, capturing methane is eligible from pre-mining via underground boreholes and surface drainage of CBM, during mining from VAM that would normally be vented, as well as post mining from abandoned/decommissioned mines.

4.9.2. Potential CER volume

Of the 84 CMM projects that have been registered under the CDM, all are located in China, except for one project in Mexico. Projects from other countries, including India, Indonesia, Philippines and South Africa have been submitted to the UNFCCC but not registered.⁷⁴ As of 1 May 2014, 34 million CERs have been issued from 37 projects located in China. The total volume of credits expected from the credit start dates up to 2020 is 170 million CERs (Section 2.3).

The best conditions for CMM projects are deep coal mines with high methane concentrations. Under these conditions, methane is concentrated and easy to collect. For geographic and regulatory reasons, coal mines in China have been well suited for CMM projects to date. In India, for example, most coal mines are surface mines, where methane concentrations are lower and it is harder to collect the methane. Another barrier in India is national regulation that divides permits for using coal and gas. This means that coal mines do not have a permit to utilise the methane gas generated and would be unable to authorise a CMM project. A CMM project would require an additional permit process, an added administrative barrier.

⁷⁴ There are two projects under validation from India and one from the Philippines. Projects in Indonesia and South Africa have had their validation terminated or validation replaced.

4.9.3. Additionality

All of the registered CMM projects use the large-scale ACM0008 methodology. The most recent ACM0008 Version 8 requires use of the “Combined tool to identify the baseline scenario and demonstrate additionality” and provides further guidance on the application of the tool in the context of CMM projects. As of May 2014, no projects had been registered under version 8, which was approved in February 2014. The majority of projects are registered under versions 6 and 7. In these prior versions, the CDM additionality tool was applied, and a separate procedure was used to select the baseline scenario. Starting with version 6, the methodology was changed to allow for benchmark analysis as part of investment analysis for projects where no investment would occur in the baseline scenario.

Most CDM CMM projects apply a benchmark analysis to demonstrate additionality, as shown in Table 4-4. Benchmark analysis compares the financial performance of the project, often expressed as IRR, to a relevant benchmark or investment ‘hurdle rate’. In contrast to some other project types, CER revenue for CMM projects does make up a large portion of the return on investment on capital expenditures for projects. According to information from PDDs, the IRR without CER revenue is approx. 2% on average and increases to approx. 28% with CER revenues, the largest increase among all project types (Section 2.4). When we derive a simple indicator that puts the capital investment in relation to the number of CERs generated over ten years, as referenced in Section 2.4 in this report, we find an average ratio of about USD 4 / CER for all CMM projects. These calculations show that CMM projects have a high likelihood of additionality. They support reports from technical experts and project developers that abatement costs for CMM co-generation plants are approximately USD 3 - 5 per tCO₂ during 10 years of operation. Other reports indicate that CMM projects are usually not economically viable; according to United Nations (2010) power generation from CMM only becomes economically viable for coal mines with very large methane sources exceeding 20 m³/t (United Nations 2010).

Table 4-4: Additionality approaches used by CDM CMM project activities

Additionality approach	Number of project	Average Annual CERs (1,000)
Benchmark Analysis	76	33,465
Investment Comparison Analysis	4	1,557
Investment Comparison Analysis and Benchmark Analysis	1	266
Simple Cost Analysis	4	1,883

Sources: IGES 2014

A high likelihood of additionality is also supported by observation of common practice in the sector. Coal mines are very averse to having any combustion on-site. Combustion of any kind increases the potential risk of a methane gas explosion. Venting methane is the safest approach to avoid combustion, and miners and management are very familiar with this approach. Coal mine operators are generally averse to having a methane combustion system onsite as a result in order to avoid the risk of mine closures due to concerns around worker safety. Global Methane Initiative staff reported that in China, prior to the presence of the carbon market, efforts by the Global Methane Initiative were wholly unsuccessful in implementing CMM projects. No pilot projects or sponsored projects were able to get off the ground. Technical barriers were significant and persistent. The equipment used was unable to cope with the difficulties of the coal mine system, including the concentrations of volatile methane and the gas volumes. Only with the revenue from CERs were there sufficient incentives to develop technologies that worked well for these conditions. Now, in

China, it has become common practice for large coal mines to capture methane with revenue from a CDM project. As of 2014, there were still 2 projects in China at the validation stage; however since the technology for developing CMM projects in China is now proven, it can no longer be claimed to be first of its kind or a technology barrier. Although the CMM projects have become common practice, this has only been the case with CDM revenue. Overall, the risk for non-additionality is low for VAM projects.

4.9.4. Baseline emissions

Baseline emissions are calculated as the sum of CO₂ emissions from destruction of methane that would occur in the baseline scenario, emissions from the production of power, heat, or use of gas replaced by the project activity, and release of methane into the atmosphere that is avoided by the project activity. The baseline scenario is selected based on an examination of all the options that are technically feasible and comply with applicable regulations and elimination of all baseline scenario alternatives that face prohibitive investment, technological and/or prevailing practice barriers.

There is some concern that mines may take part in marginally more pre-mining drainage than they would have done without incentives from the CDM; however, the drained methane would likely have been emitted upon mining (and likely would have been emitted through ventilation later on). So these concerns seem limited, given that there are provisions in the methodology that emission reductions may only be credited once mining starts, ensuring that CERs are not issued in cases in which mining may not have occurred under the baseline. Our review has not identified any other concerns related to the determination of baseline emissions.

4.9.5. Other issues

The methodology includes a requirement that methane collection must exceed that which is required by applicable regulations, with the exception of cases in which it can be shown that the regulation is not enforced. A regulation was put in place in China requiring that methane captured from coal mines that exceeds 30% methane concentration must be captured and used. It has been suggested by project proponents that the Chinese government actually put this regulation in place as a result of the success of the CDM, to support the use of CDM financing to capture methane as best practice and to stimulate more CDM project development. However, interpretations vary and it has led to questions around the additionality of projects and whether or not they would have been required by regulation. As a consequence, project developers focused on projects where the methane concentration was below 30%. These projects would be avoided for safety reasons in North America or Europe, because this gets close to the explosive range of methane concentrations of 15-25%. It is better practice and safer to improve the capture rate and increase the concentration of methane, however this could run the risk of exceeding the 30% concentration regulatory requirement in China, and hence not meeting the CDM additionality requirements. This raises the risk of perverse incentives for project developers to diluting methane gas to reduce the concentration below 30% in order to be eligible for the CDM. However, no evidence is available whether this happened.

4.9.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • Likely to be additional • CDM revenue makes up a large portion of return on capital investment • Technology for CMM in China is now well demonstrated, no longer technical barriers
Over-crediting	<ul style="list-style-type: none"> • Potential concerns regarding increased mining and/or pre drainage of coal mine methane but no evidence whether or not this occurs
Other issues	<ul style="list-style-type: none"> • Potential perverse incentives to dilute methane in order to avoid that abatement is required by regulations

4.9.7. Recommendations for reform of CDM rules

There are no recommendations regarding reforming the CDM rules for CMM projects. Further investigation of China's regulations for methane capture are warranted to ensure that perverse incentives are avoided.

4.10. Waste heat recovery

4.10.1. Overview

Waste heat utilization includes generally energy efficiency measures, where the thermal content of hot waste gases that would be vented in the absence of the CDM project activity is used for heating purposes, replacing fossil fuel use. For example, hot exhaust gases from cement kilns can be used to pre-heat the raw material before entering into the kiln.

A related category of projects is waste gas utilization where the calorific value of waste gases that contain a certain fraction of hydrocarbons or hydrogen that would be flared in the absence of the CDM project activity is used to replace regular fossil fuels. For example, waste gases with a high content of carbon monoxide and hydrogen can be used as fuel for steam production in industry. This second project category has similar features than the 'thermal' recovery of waste gases, but the present chapter focusses on the first category.

4.10.2. Potential CER volume

According to our own estimates, registered CDM projects have the potential to issue 0.35 billion CERs by the end of their respective crediting periods, of which 0.22 billion CERs fall in the period from 2013 to 2020 (Table 2-1). CERs from these projects account for about 2.5% of the total CER issuance potential.

4.10.3. Additionality

The methodologies for waste heat utilization (AM58, AM66, AM95, AM98, ACM12, AMS-II.I., AMS-III.P.AMS-III.Q., AMS-III.BI.) generally use standard CDM additionality tests based on barrier and/or investment analysis.

The general issue with this project type is that the use of waste heat is a standard practice in many integrated industrial facilities, in particular where energy costs represent a larger fraction of production costs such as in cement production, refineries, iron and steel and chemicals. However, the extent of the use of waste heat and energy efficiency may vary significantly even within a country, as energy costs, financial resources and engineering and management skills may differ between sectors and plants. While one steel plant may define its competitive edge in systematically using all waste heat and reducing heat loss along the steelmaking process because of competitive steel markets and relatively high fuel costs, a refinery plant may vent significant amounts of waste heat and experience severe heat losses all over the refinery because its cost of fuel is very low.

In the use of investment analysis for demonstrating additionality for waste heat recovery projects involves several uncertainties: the highest uncertainties are in the assumptions on future fuel prices which show high variability over time (Figure 2-4 to Figure 2-6). In addition, the considerable uncertainties in investment cost for equipment and construction and the often uncertain impact of the considered measure on efficiency makes it difficult to objectively determine the profitability of the measure and the relevant hurdle rate (Section 3.2).

For projects implemented in existing plants, the methodologies require demonstrating that the waste heat or gas has been flared/vented at least three years before the project implementation. This is an important safeguard to assure at least some degree of additionality.

Some methodologies, such as ACM0012, also allow waste heat recovery projects in greenfield plants. This is very problematic, as it is very difficult to demonstrate that the waste heat utilization would not have been implemented in the absence of the CDM (Section 3.2). The methodology ACM0012 (V.5) provides for two options for demonstration additionality in the case of greenfield plants. Option 1 requires to identify similar plants; the project is deemed as additional “if *more than 80 per cent of the analyzed facilities in the list do not use waste energy, it can be decided that the proposed Greenfield facility also would have wasted the energy in the absence of waste energy recovery CDM project*”. While the methodology tries to be descriptive on how to identify baseline waste energy use, there remain large uncertainties and most importantly, data on the degree of waste energy usage in plants from competitors may be very difficult to obtain. Under option 2, project participants can submit a (hypothetical) *alternative design* without or with a lower level of waste heat recovery and demonstrate using investment analysis that the alternative design would be the baseline scenario for the waste energy generated in the greenfield facility. Given the high uncertainties in price data and hypothetical level of waste heat utilization in the absence of the CDM, this leads to significant risks of non-additionality.

The economic impact of CERs on the profitability of the waste heat recovery project is usually rather small compared to related fuel cost saving. I.e. a change in fuel costs of a few percent may have the same impact as the CER revenues (Sections 2.4 and 3.2).

Overall, the risk for non-additionality of greenfield plants seems higher than for existing plants, where the requirement for a minimum of three years of generation of waste heat prior to the start of operation of the CDM project has to be demonstrated.

4.10.4. Baseline emissions

Baseline emissions are usually derived from the amount of waste heat used in the project case. It is assumed, that this heat would be generated by fossil fuels in the baseline scenario.

However, even though the methodologies for existing facilities require demonstrating that the waste heat or gas has been flared/vented at least three years before the project implementation, in practice it may be very difficult to rule out that waste heat has not been used in some form in existing facilities before project implementation, which may inflate baseline emissions.

Also, waste heat recovery may lead to a different operation of the plant than in the baseline scenario. For example, if waste heat is used for pre-heating of a product, the plant may be run in such a way that more waste heat is generated to assure a certain temperature level of the pre-heated product, which leads to a higher fuel consumption in the boiler generating the waste heat. Therefore the amount of heat wasted in the baseline may be overestimated. Moreover, baseline usually do not capture any other autonomous energy efficiency improvements that might be implemented in the absence of the project.

In greenfield projects, the emission reduction is based on the difference in emissions in modelling a baseline and project scenario. The models build on many assumptions that are difficult to validate objectively. The results are therefore prone to high uncertainty and may lead to over-crediting.

Lastly, the methodologies do not consider emission reductions from the reduction in upstream emissions (such as from the production of natural gas or coal) which leads to a slight under-crediting, if upstream emissions occur in a non-annex I country.

4.10.5. Other issues

None.

4.10.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenues are very small compared to cost reduction from fuel savings • Ex-ante estimation of key parameters including investment costs and fuel savings has large uncertainties • Waste heat recovery is common practice in many countries and sectors (though not in all)
Over-crediting	<ul style="list-style-type: none"> • In existing facilities: It is very difficult to rule out that waste heat has not been used in some form before project implementation, which may inflate baseline emissions • In greenfield projects: Modelling of amount of waste heat lost in baseline is subject to very high uncertainties. • Waste heat recovery may lead to a different operation of the plant than in the baseline case, e.g. to assure a certain temperature level of the heat medium or to NCV level of waste gas, therefore the amount of gas wasted in the baseline may be overestimated
Other issues	<ul style="list-style-type: none"> • None

4.10.7. Recommendations for reform of CDM rules

Waste heat recovery is standard practice in many energy intensive industrial sectors, though there exist barriers to the implementation of waste to energy measures. The high uncertainty in additionality demonstration make it less suitable for the CDM, the project type may be taken out of the CDM or restricted to cases with clear additionality demonstration, e.g. of a very low uptake of waste heat recovery can be demonstrated in a specific industrial sector. We recommend that option 1 in Appendix 1 of ACM0012 be maintained as it provides a more objective way of assessing the practice in the sector and country and that option 2 not be used.

4.11. Fossil fuel switch

4.11.1. Overview

Fossil fuel switch includes the switching from a fuel with higher carbon intensity (such as coal or petroleum) to a fossil fuel with lower carbon intensity (such as natural gas) in the generation of heat for industrial processes or in power plants. In this section we do not consider switching from fossil fuels to biomass. Methodologies are for existing installations only (e.g. ACM0009, ACM0011, AMS-III.AH., AMS-III.AN) or for both existing and greenfield installations (AMS-III.B and AMS-III.AG – power only).

4.11.2. Potential CER volume

According to our own estimates, registered CDM wind power projects have the potential to issue 0.46 billion CERs by the end of their respective crediting periods, of which 0.23 billion CERs fall in

the period from 2013 to 2020 (Table 2-1). CERs from wind power account for about 3.3% of the total CER issuance potential.

4.11.3. Additionality

Both fossil fuels with higher carbon intensity such as hard coal, lignite or fuel oil and fuels with lower carbon intensity such as natural gas are widely used in stationary installations in energy and manufacturing industries as well as in the buildings sector. In existing facilities, the choice of fuel is often determined by the existing fuel, because fuel changes may be costly, though there are also multi-fuel systems. In greenfield plants, the fuel choice usually depends on the economic viability of each fuel option.

Table 4-5: Examples of differences in characteristics between the use of coal and fuel oil compared to natural gas

Characteristics	Hard coal, lignite (fuel with high carbon intensity)	Natural gas (fuel with lower carbon intensity)	Considered in investment analysis
Initial investment for burner/boilers etc.	Higher	Lower ¹⁾	Yes
Fuel cost per energy unit	Lower	Higher	Yes
Non-fuel operation costs	Higher	Lower	Yes
Flexibility in operation ²⁾	Lower	Higher	No
Means of distribution to end-user	Vehicle-based: by trucks, train i.e. requires access roads or rails	Network based: by distribution lines ³⁾	No
Price building mechanisms	In many countries based on world market price	In many countries price is based on local long term contracts, often taking into account a price index, e.g. based on oil price	No
Dependence on specific supplier	Lower	Higher	No
Compliance with local air quality standards (if any)	More difficult: Coal based furnaces may require expensive exhaust cleaning systems	Less difficult: Natural gas based furnaces have generally lower air pollutant emission levels ⁴⁾	No
Need of space for local fuel storage	Yes	No ⁵⁾	No

Notes: ¹⁾ This is the case if the (higher) investment for distribution lines necessary to connect to the natural gas grid is borne by a different entity, e.g. the natural gas supplier. In case of LNG initial investment costs may be somewhat higher for LNG terminals, local storage facilities etc. ²⁾ E.g. shorter time lag to start-up operation of power plant if dispatching system in a grid requires more power. ³⁾ Or Vehicle based in case of LNG. ⁴⁾ Please note that this may hold true even though local air quality standards may be stricter for natural gas than for coal-based systems. ⁵⁾ Except for LNG.

Sources: Author's own research

The large-scale methodologies ACM0009 and ACM0011 require an investment analysis for demonstrating additionality, a barrier analysis (Section 3.2) is not deemed sufficient.⁷⁵ This makes sense as the economic viability may be seen as one of the key aspects when deciding on a specific fuel. Requiring investment analysis may reduce the risk of non-additionality, because using this

⁷⁵ Though e.g. ACM0009 allows for the additionality to be proven by claiming „prohibitive barriers“ for the project (natural gas) scenario applying step 3 of the additionality tool.

test may be more difficult in the case of very lucrative fuel switches (e.g. if cheap natural gas becomes newly available in a project site).

In general, fuel prices per energy unit are generally lower for coal than for natural gas. This is offset to a certain degree by higher initial investment and non-fuel operation costs for coal furnaces (Table 4-5). However, while the investment analysis takes these cost factors into account, there could be other factors that may lead to the choice of natural gas as a fuel, even though it may be economically somewhat less attractive than lignite or hard coal.

An issue that contributes to the high uncertainty in investment analysis are the assumptions made about future developments of fuel prices. In the investment analysis, the fossil fuel switch methodologies allow to choose between (i) keeping fuel prices at present levels for future years, or (ii) to use future prices that *“have to be substantiated by a public and official publication from a governmental body or an intergovernmental institution”* (ACM0009 V.5, Section 5.2.4).

For small-scale projects, however, the barrier analysis is deemed sufficient, which may considerably increase the risk of non-additionality (Section 3.3). This risk is only somewhat mitigated by some small-scale methodologies requiring that the CDM project involves at least some capital investments⁷⁶, ruling out projects where fuel switch can be carried out without any investment in additional fuel switching equipment, e.g. in natural gas burners. Still, small-scale fuel switching methodologies have the full set of issues that have been identified for barrier analysis (Section 3.3).

In addition, similar to other energy related project types, with fuel switch projects CER revenues are very small compared to typical fluctuations of price differences between fuels (dark-spark spread), which increases the risk of non-additionality.

4.11.4. Baseline emissions

The exploitation, transport, processing and distribution of fossil fuels results in upstream emissions, many of which may originate in non-Annex I countries. In most CDM project types, the amount of fossil fuel used is *reduced* with the project; therefore, it may be assumed that also upstream emissions are reduced. As a conservative simplification, the relevant methodologies usually do not consider upstream emissions. In the case of fossil fuel switch, however, upstream emissions from fossil fuels could either increase or decrease. In general, upstream emissions from natural gas tend to be higher than upstream emissions from lignite, hard coal or fuel oil (depending on source of fuel).

With fuel switch activities the amount of fuel used in terms of energy content remains more or less constant (or may slightly be reduced because of higher efficiency of natural gas burners). Because of the potentially higher upstream emissions of natural gas, switching from coal/oil to natural gas may result in an increase in upstream emissions, the so-called ‘upstream leakage’ emissions. For this reason, CDM methodologies for fossil fuel switch projects consider upstream emissions.

The procedures for estimating upstream emissions are included in the methodological Tool “Upstream leakage emissions associated with fossil fuel use” (V.1, EB69 Annex12). The tool allows project developers to use default values for upstream emissions or to come forward with their own values derived from relevant data. The default values have been substantially revised with the tool (e.g. from the values included in Table 3 of methodology ACM0009 V.4 (EB68 Annex 12)).

For instance, according to the latest version of the tool, default upstream emissions values from natural gas are 2.9 tCO₂/TJ, based on data from the US. This is comparable to the 2.6 tCO₂/TJ

⁷⁶ For example, as in the applicability requirements of small-scale methodology AMS-III.B (V.18): “The methodology is limited to fuel switching measures which require capital investments. Examples of capital investment include creating infrastructure required to use project fuel or retrofitting existing installations.”

(105 tCH₄/PJ; total) default upstream emissions in Western Europe in ACM0009 V.4 (based on IPCC), but is much lower than in e.g. the former values for Eastern Europe and former Soviet Union (23 tCO₂/TJ) or Rest of the World (7.4 tCO₂/TJ).

Also, the revised aggregated default values for natural gas (Table 1 in the tool) of 2.9 appears much lower than the sum of the default values for the different elements in the upstream chain of natural gas (Table 3 in the tool), including exploration and production (3.4 tCO₂/TJ), processing (4 tCO₂/TJ), storage (1.6) and distribution (2.2). The latter are all based on the US Department of Energy's GREET model, which may not necessarily be representative for upstream emissions of natural gas in developing countries.

With this, the revised values become comparable to those from (underground) coal. It is unclear whether this is a reasonable assumption or an artefact because of the origin of the natural gas upstream emissions data. If the values in the upstream tool are not conservative, i.e. provide too low default values for natural gas upstream emissions, this would lead to an increased risk of over-crediting of fuel switch projects.

An additional issue is the assumptions for the default values on the share of upstream emissions that are covered by caps of Annex-I countries – and how effective these caps are in limiting upstream emissions.

Table 4-6: Default emission factors for upstream emissions for different types of fuels reproduced from upstream tool (Version 01.0.0)

Fossil fuel type x	Default emission factor (tCO ₂ e/TJ)
Natural Gas (NG)	2.9
Natural Gas Liquids (NGL)	2.2
Liquefied Natural Gas (LNG)	16.2
Compressed Natural Gas (CNG)	10
Light Fuel Oil (Diesel)	16.7
Heavy Fuel Oil (Bunker or Marine Type)	9.4
Gasoline	13.5
Kerosene (household and aviation)	8.5
LPG (including butane and propane)	8.7
Coal/lignite (unknown mine location(s) or coal/lignite not 100%)	Lignite Surface mine, or any other situation Underground (100% source)
	2.9 2.8 10.4
Coal/lignite (coal/lignite 100% sourced from within host country)	Lignite Surface mine, or any other situation Underground (100% source)
	6 5.8 21.4

Notes: The detailed table 3 in tool does not seem to provide data for conventional NG upstream emissions.

Sources: EB69, Annex 12, <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-15-v1.pdf>

Table 4-7: Former default emission factors for upstream emissions for different types of fuels

Activity	Unit	Default emission factor	Reference for the underlying emission factor range in Volume 3 of the 1996 Revised IPCC Guidelines
Coal			
Underground mining	t CH ₄ / kt coal	13.4	Equations 1 and 4, p. 1.105 and 1.110
Surface mining	t CH ₄ / kt coal	0.8	Equations 2 and 4, p.1.108 and 1.110
Oil			
Production	t CH ₄ / PJ	2.5	Tables 1-60 to 1-64, p. 1.129 - 1.131
Transport, refining and storage	t CH ₄ / PJ	1.6	Tables 1-60 to 1-64, p. 1.129 - 1.131
Total	t CH ₄ / PJ	4.1	
Natural gas			
<i>USA and Canada</i>			
Production	t CH ₄ / PJ	72	Table 1-60, p. 1.129
Processing, transport and distribution	t CH ₄ / PJ	88	Table 1-60, p. 1.129
Total	t CH ₄ / PJ	160	
<i>Eastern Europe and former USSR</i>			
Production	t CH ₄ / PJ	393	Table 1-61, p. 1.129
Processing, transport and distribution	t CH ₄ / PJ	528	Table 1-61, p. 1.129
Total	t CH ₄ / PJ	921	
<i>Western Europe</i>			
Production	t CH ₄ / PJ	21	Table 1-62, p. 1.130
Processing, transport and distribution	t CH ₄ / PJ	85	Table 1-62, p. 1.130
Total	t CH ₄ / PJ	105	
<i>Other oil exporting countries / Rest of world</i>			
Production	t CH ₄ / PJ	68	Table 1-63 and 1-64, p. 1.130 and 1.131
Processing, transport and distribution	t CH ₄ / PJ	228	Table 1-63 and 1-64, p. 1.130 and 1.131
Total	t CH ₄ / PJ	296	
Note: The emission factors in this table have been derived from IPCC default Tier 1 emission factors provided in Volume 3 of the 1996 Revised IPCC Guidelines, by calculating the average of the provided default emission factor range.			

Sources: EB68 Annex 12, ACM0009, V.4, Table 3, http://cdm.unfccc.int/filestorage/r/t/4M2I7TA9GRCU5QDB0JLNHK6PY1ZOWE.pdf/eb68_repan12.pdf?t=Z0p8bzJ3YnExfDBVPWpbmgO_k-sMZsZlso1q

4.11.5. Other issues

None.

4.11.6. Summary of findings

Additionality	<ul style="list-style-type: none"> Small-scale methodologies for fuel switching do not require investment analysis but may build only on barrier analysis, which provides a high risk for non-additionality Even in large scale methodologies, modelling of fuel choice depends not only on prices, but also on availability/reliability, need for diversification, and operational needs (e.g. NG power plants for covering peak demand); this may imply that the investment analysis may not be sufficient to determining additionality CER revenues are very small compared to typical fluctuations of the price difference between fuels (dark-spark spread)
Over-crediting	<ul style="list-style-type: none"> Upstream emissions need to be taken into account, but with the revised default values of the tool they may not be addressed in an adequate way anymore
Other issues	<ul style="list-style-type: none"> None

4.11.7. Recommendations for reform of CDM rules

In sum, the revision of upstream default values as documented in the tool practically eliminates the consideration of upstream emission in a fuel switch e.g. from (underground) coal to natural gas. The assumptions behind the revisions (mostly data from the US may not be representative for the situation with natural gas used in developing countries and require urgent independent analysis and revision.

4.12. Efficient cook stoves

4.12.1. Overview

Under the CDM, there are two methodologies applicable to efficient cook stoves. AMS-II.G⁷⁷ applies to cases where inefficient existing cook stoves are replaced by improved-efficiency cook stoves to reduce the demand for non-renewable biomass. AMS-I.E⁷⁸ applies to cases where a renewable technology, such as biogas or solar cookers, is introduced to displace existing cook stoves using non-renewable biomass. The number of projects has increased quickly since the introduction of these methodologies in 2008/2009. Most notably the introduction of PoAs, enabling multiple project activities to be registered through a single approval process, has lowered the transaction costs and increased scalability for projects like efficient cook stoves.

4.12.2. Potential CER Volume

As of 1 July 2015, a total of 102 cook stove projects have been registered under the CDM, 37 as individual CDM project activities and 65 as PoAs (along with a total of 180 individual CDM Program Activities (CPAs)).

Table 4-8: Number of efficient cook stove single CDM project activities by country

Country	Number of CDM project activities	Annual CERs (1,000)	Avg. CERs per CDM project activity (1,000)
China	1	12	12
India	29	469	16
Lesotho	1	34	34
Malawi	2	71	35
Mozambique	1	192	192
Nepal	1	20	20
Nigeria	1	31	31
Zambia	1	130	130
Total	37	960	

Sources: UNEP DTU 2015a

Project activity under the CDM peaked in 2012 and dropped sharply in 2013. As of 1 July 2015, single CDM cook stove projects are mostly located in the Asia and Pacific regions (Table 4-8), while component project activities developed under PoAs are predominantly located in Africa, as shown in Table 4-9. The annual volume of CERs estimated by project developers from PoA projects is 9.2 million, nearly 10 times the annual volume of CERs projected from single CDM project

⁷⁷ AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass, <https://cdm.unfccc.int/methodologies/DB/UFM2QB70KFMWLV07LJN8XD1O2RKHEK>.

⁷⁸ AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user, <https://cdm.unfccc.int/methodologies/DB/O799FU5XYGECUSN22G84U5SBXJVM6S>.

activities of 0.96 million. Many of the registered PoAs have only 1 or a few CPAs associated with them (Table 4-9), so there is potential to scale up CPAs in these cases. In Bangladesh and Madagascar, many individual CPAs have already been developed under the one PoA registered in each of these countries (Table 4-9).

Table 4-9: Number of efficient cook stove PoAs and CERs by country and methodology

Country	Number of PoAs	Annual CERs (1,000)	CPAs per PoA	Annual CERs/ CPA (1,000)
Bangladesh	1	543	11	49
Burkina Faso	2	68	1	68
Burundi	2	452	4	113
China	1	10	1	10
Congo DR	3	124	1	124
Côte d'Ivoire	2	160	2	80
El Salvador	2	90	1	90
Ethiopia	3	201	2	121
Ghana	2	377	4	108
Guatemala	1	43	1	43
Haiti	2	68	1	68
Honduras	1	34	1	34
India	5	543	2	302
Kenya	4	319	2	159
Madagascar	1	4,198	59	71
Malawi	6	299	1	257
Mali	1	33	1	33
Mexico	1	40	1	40
Mozambique	1	28	1	28
Myanmar	1	43	1	43
Nepal	4	204	2	136
Nigeria	2	226	4	56
Rwanda	3	229	2	114
Senegal	3	209	1	209
South Africa	1	32	1	32
Tanzania	1	63	1	63
Togo	3	48		144
Uganda	3	265	2	132
Zambia	3	345	3	129
AMS-I.E	7	4,657	9	509
AMS-II.G	57	4,535	2	2,371
AMS-I.E + AMS II.G	1	100	1	100
Total	65	9,292		

Sources: UNEP DTU 2015a

4.12.3. Additionality

Improved cook stove methodologies under the CDM fall under one of two types: improved energy efficiency (AMS-II.G) or fuel switching to renewable energy (AMS-I.E). Under both methodologies projects must apply the CDM “Guidelines on the demonstrating of additionality of SSC project activities” (Methodological Tool: Demonstration of additionality of small-scale project activities. Version 10.0). Following these CDM guidelines, projects using either of these methodologies are on

the positive list of project types and automatically considered additional so long as each unit is no larger than 5% of the small-scale CDM threshold (750 kW installed capacity or 3000MWh energy savings per year or 3,000 metric tons emission reductions per year), and end users are households/communities.

Lambe et al. (2015) reviewed PDDs for cook stove projects in Kenya and India. Although projects are considered automatically additional and were thus not required to document barriers, the study found that several did include a discussion of barriers in the PDDs. The most-cited barrier was household poverty, which makes improved stoves unaffordable. The study found that several PDDs for projects in Kenya include simple cost analysis to assess the ability of households to purchase an efficient cook stove based on their income and their costs for food and fuel; the calculations suggest that households would need to save 22–30% of their remaining income for a year to purchase a stove. This claim was supported in the pricing models the authors found used by projects in rural areas, which nearly exclusively distributed stoves for a free or subsidized price. In an urban setting, the study found that many projects were selling stoves at the retail price with micro-finance options. The study noted that these PDDs suggest that since urban households are already purchasing charcoal, they have an incentive to buy an improved cook stove to reduce their fuel costs. The study authors also found that many projects also cited the lack of access to credit for working capital, low profit margins, high upfront capital costs, lack of sufficient consumer outreach and support for program operations, reduced consumer demand resulting from failure of past efforts, need for ongoing improvement and modifications of stoves to suit user needs as barriers to project implementation.

Lambe et al. (2015) also investigated what contribution offset revenues make to the overall project revenue. The study reviewed claims made in PDDs regarding the use of offset revenue and found that a majority of projects planned to use offset sale revenues to subsidize the price of improved cook stoves, as well as to cover operational costs, including maintenance and replacement of stoves, training of cook stove users, outreach and marketing to households, microcredit systems and distribution. Interviews of market actors affiliated with these projects by the authors found that while some projects were entirely dependent on offset revenue, others admitted that given the uncertainty in revenue from offsets it was advantageous not to depend on carbon revenues.

These conclusions raise substantial concerns about the additionality of improve cook stove projects under the CDM. Carbon revenues are more likely to be a primary financial enabler of projects in rural areas, where revenues are needed to subsidize the price of stoves. In urban areas, where households have a financial incentive to reduce their fuel purchasing costs, business models without carbon financing may be more viable. While these factors may reduce confidence in the additionality of cook stove projects in urban areas, low income urban households are unlikely to be able to afford more efficient and more costly cook stoves with a payback period of more than a few months.

4.12.4. Baseline emissions

In both types of cook stove projects – improved efficiency and fuel substitution – emission reductions are calculated as the product of the amount of woody biomass saved, the fraction that is considered non-renewable biomass, the net calorific value (NCV) of the biomass, and an emission factor for the fuel used. The net calorific value of the non-renewable biomass ($NCV_{biomass}$) is relatively straightforward – it is empirically measurable and a default value from the Intergovernmental Panel on Climate Change (IPCC) exists. However, Lee et al. (2013) concluded that there is uncertainty in the approaches to estimating the other parameters: biomass fuel consumption (B_f), fraction of non-renewable biomass (f_{NRB}), and emission factors for fuel combustion ($EF_{projected_fossilfuel}$). A study by Johnson et al. (2010) assessed the relative contributions of these three variables to the overall uncertainty in

carbon offset estimation for an improved cook stove project in Mexico and found that fuel consumption (B_y) contributed to 28% of the uncertainty, fraction of non-renewable biomass (f_{NRB}) contributed 47%, and emission factors ($EF_{projected_fossilfuel}$) accounted for 25%.

The CDM methodology AMS-II.G presents project developers with three options for quantifying biomass fuel savings from improved stoves: the Kitchen Performance Test (KPT), the Water Boiling Test (WBT), and the Controlled Cooking Test (CCT). The WBT and CCT are laboratory-based methods, whereas the **Kitchen Performance Test** is done in the field, and can thus better represent stove users' actual cooking behaviour. The primary advantage of the **Water Boiling Test** is its simplicity and reduced costs; the laboratory-based method is standardized and replicable. However, the laboratory results on stove performance do not necessarily translate to cooking actual meals in households, and thus the accuracy of this method is frequently called into question (Abeliotis & Pakula 2013; Johnson et al. 2007). Meanwhile, the **Controlled Cooking Test** protocol provides a compromise, better representing local cooking while being conducted in a controlled environment. Berrueta et al. (2008), which evaluated the performance of a stove designed primarily for tortilla-making by using all three tests and found that the WBT "gave little indication of the overall performance of the stove in rural communities", while the CCT was somewhat more predictive of the fuel savings found by the KPT (44-65% for CCT vs. 67% for KPT). There may be options for reducing costs associated with the KPT, such as having local NGOs perform the tests rather than hiring expensive international consultants, as well as opportunities to improve the WBT. In recent years, more comprehensive and appropriate testing methods and performance standards are under development through both ANSI and ISO standardisation organisations. The CDM methodology provides default efficiency values for two traditional stove types – a three-stone fire, or a conventional system with no improved combustion – as well as a default efficiency value for devices with improved combustion air supply or flue gas ventilation. Experts interviewed by Lee et al. (2013) noted that these limited defaults do not cover the range of cook stoves in most countries. The CDM Small-Scale Working Group (CDM SSC WG) considered this in the past, but made the determination not to proceed with developing regional default efficiency values for traditional cook stoves because of the huge variability in values among the available data (UNFCCC 2012a). Lee et al. (2013) conclude that although the KPT is more logistically complicated, and time- and resource-intensive, testing stoves outside of a controlled laboratory setting and using a variety of typical cooking activities appears to be an important factor in ensuring accurate and credible results in the baseline or default analysis. Overall, evidence suggests the Water Boiling Test is not an appropriate tool for assessing baseline fuel consumption and should be removed from the CDM methodology. The methodology should require the use of either the Kitchen or Controlled Cooking Tests. AMS-I.E follows a similar approach for calculating baseline emissions from fuel substitution of cook stoves.

The factor f_{NRB} represents the fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass and is a key variable in all current cook stove offset methodologies

Based on its definition of renewable biomass (UNFCCC 2006b), the EB has identified several indicators of scarcity to help identify non-renewable biomass. Woody biomass is considered non-renewable if at least two of the following indicators are shown to exist:

- A trend showing an increase in time spent or distance travelled for gathering fuelwood, by users (or fuelwood suppliers) or alternatively, a trend showing an increase in the distance the fuelwood is transported to the project area;
- Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area;

- Increasing trends in fuel wood prices indicating a scarcity of fuel-wood;
- Trends in the types of cooking fuel collected by users that indicate a scarcity of woody biomass (UNFCCC 2011a).

In 2012, the EB issued national default factors for f_{NRB} based on a highly aggregated approach, balancing the mean annual increment in biomass growth (MAI), the annual change in living forest biomass stocks (ΔF) and biomass growth in protected forest areas (UNFCCC 2012a). Under this approach, f_{NRB} values were calculated for nearly 100 countries, based on the total annual national biomass removals minus the portion of demonstrably renewable biomass from growth in protected reserve areas. The large majority (over four-fifths) of default values exceed 80%, with the remainder ranging from 40% to 77%. While Lee et al. (2013) noted that market actors interviewed characterize development of default f_{NRB} values as a ‘huge triumph’, there was also recognition by market actors and researchers interviewed that national-level forest growth and total forest harvest removal data alone do not necessarily capture the impact of fuelwood harvesting on carbon stocks. First, the approach does not distinguish removals for timber harvesting from those for fuelwood. Furthermore, there is no justification or validation of whether the change in national carbon stocks has any correlation to fuelwood harvesting. Second, according to this method, high values of f_{NRB} are calculated for countries with significant deforestation. However, deforestation could occur in different geographical areas and be driven by entirely other factors than fuel wood collection. In practice, renewable biomass may be extracted both from plantations and natural forests that are not under protection. The MAI approach is better suited to assess the fraction of harvested wood products that are renewable, rather than fuelwood. Using the change in carbon stocks due to harvested wood products has the potential to significantly overestimate the fraction of non-renewable biomass. Estimates published by de Miranda Carneiro et al. (2013), based on the use of a spatially-explicit land use model to examine the availability of fuelwood, suggest default values for f_{NRB} of wood-fuel on the order of 20–30%, much lower than the prior estimates. Bailis et al. (2015) estimate that 27–34% of woodfuel harvested was unsustainable, with large geographic variations, and conclude that cookstove methodologies probably overstate the climate benefits.

Under the CDM methodology AMS-II.G and AMS-I.E, the quantification of project emission reductions relies on the factor $EF_{projected_fossilfuel}$, representing the fossil fuel emission factor of “substitution fuels likely to be used by similar users”. Since emission reductions from the LULUCF sector can only be claimed from afforestation and reforestation under the CDM, the use of fossil fuel emission factors for baseline fuels represents something of a workaround. While the short-term emission reductions actually occur from avoiding the depletion of carbon stocks, such as avoiding deforestation, emission reductions are calculated using fossil fuel emission factors. One possible argument for this approach is that kerosene or LPG cook stoves might be used by the households if they had a higher income. In this regard, the consideration of emissions from fossil fuel based cooking devices might be regarded as a suppressed demand baseline. However, the approach combines the efficiency of fuel-wood cook stoves with the CO₂ emission factor of fossil fuels. This approach has been roundly criticized. Johnson et al. (2010) say it has “no scientific basis, given that wood emits approximately double the CO₂ per unit fuel energy compared to LPG or kerosene thus halving possible offsets from non-renewable harvesting of fuel”. One could also argue that it leads to overestimating baseline emissions if one would assume the long-term suppressed demand baseline of using kerosene or LPG cook stoves. By combining the efficiency from inefficient fuel-wood cook stoves with the CO₂ emission factors from fossil fuels, the claimed baseline emissions are higher than if the households would use kerosene or LPG cook stoves. The CDM methodology AMS-II.G suggests the use of a weighted average value of 81.6 tCO₂/TJ², representing a mix of 50% coal, 25% kerosene, and 25% LPG. However, no justification for this fuel mix provided. Coal is not commonly used as a cooking fuel for households transitioning from traditional to modern biomass.

LPG is the dominant fossil fuel used in households transitioning to modern energy for household cooking. Assuming that households would use coal vs. LPG overestimates the emissions factor. For example, if we compare the emissions factor if the fuel mix was LPG vs. the current emission factor we find that the emissions are overestimated by 23%. For charcoal production, the simplification is stretched even further beyond reality. The methodologies permit calculating wood use by charcoal stoves by multiplying the charcoal volume by six, following the 1996 IPCC accounting guidelines to estimate total biomass consumed (IPCC/OECD/IEA 1996, p. 1.42). Then baseline emissions are estimated by applying the projected fossil fuel use emissions factor, which in effect assumes that the project displaces fossil fuel use for charcoal production, which likely significantly overestimates the baseline emissions (Lee et al. 2013).

4.12.5. Other issues

Improved cook stove projects are dependent on end users to achieve emission reductions: households must actually use the improved cook stoves instead of their traditional stoves. Carbon finance monitoring requirements include checking the efficiency of the stove and confirming at least every two years that the stove is still in use. Additional stove monitoring of the efficiency and usage rate is required annually or biannually. Monitoring requirements furthermore include sampling and surveying as specified in the applicable offset protocol. This has been a significant challenge. Carbon finance project monitoring requirements further specify that projects must either ensure that the improved stoves completely replace traditional stoves, or else the traditional stoves must be monitored and accounted for under the project calculations for emission reductions. Lambe et al. (2014) found in their review of projects in Kenya and India that this presented several challenges. In Kenya, where the predominant mode of traditional cooking is with a three-stone fire, the study found that many PDDs acknowledged that this form of traditional stove cannot really be removed or destroyed. In India, traditional stoves in several regions are known as chulhas. These stoves often have a religious significance and households often build the stoves themselves from locally available materials such as mud, brick, or cement (Lambe & Atteridge 2012). This form and construction makes it difficult to guarantee that a new chulha will not be made following the destruction of the old one. Lambe et al. (2014) found that many projects required households to destroy these existing cook stoves. In some cases, photographic evidence is used to demonstrate that the existing stoves have been destroyed. However, because of the challenges with removing traditional stoves and the barriers to ensuring adoption and sustained use of improved cook stoves, more often a stacking of stoves and fuels occurs where traditional and improved cook stoves are both used for different types of cooking (Ruiz-Mercado et al. 2011). While the methodologies contain monitoring guidance for adjusting the baseline fuel consumption if the traditional stove continues to be used, this adds further uncertainty to quantification of changes in fuel consumption. Use of temperature sensors to monitor usage of traditional and improved cook stoves have shown promising signs of helping to address this issue, but are not yet in widespread use in carbon market projects (Ruiz-Mercado et al. 2011).

There is a broader concern about crediting emission reductions from displacement of non-renewable biomass since the increased carbon storage from changes in carbon stocks may only lead to temporary reductions. The risk of non-permanence of emission reductions is addressed through appropriate accounting approaches for afforestation, reforestation, and carbon capture and storage project activities, but it is not addressed for improved cook stove project types. Under the CDM, there are projects promoting the use of biomass energy to displace fossil fuel, as well as improved cook stove projects aimed at decreasing biomass energy use. In theory, this does not present a conflict, assuming that biomass power projects are based in regions with increasing or stable carbon stocks and improved cook stove projects are located in regions with declining carbon stocks. However, looking at registered CDM projects there are several examples of provinces in which there are both biomass power and cook stove projects. This means that in the same prov-

ince, there are simultaneously CDM projects getting credit for increasing the use of biomass, as well as reducing the use of biomass. For example, in the Henei province in China there are 9 biomass energy projects fuelled by agricultural residues (rice husk and other kinds) as well as 4 improved cook stove projects.

4.12.6. Summary of findings

Additionality	<ul style="list-style-type: none"> • CER revenues are insufficient to fully cover project costs, confidence in additionality may be low in urban settings where households are paying for improved stoves at the retail price
Over-crediting	<ul style="list-style-type: none"> • Uncertainty in some widely used approaches for estimating biomass savings • Significant uncertainty around the fraction of non-renewable biomass values, recent research suggests this parameter may be significantly overestimated. • Emissions intensity factors of fossil fuel likely underestimate emissions relative to wood-fuel used in the baseline. • Emissions factor for suppressed demand use of fossil fuel overestimate emissions; LPG is the appropriate substitute used by similar consumers, including coal and kerosene overestimate emission reductions.
Other issues	<ul style="list-style-type: none"> • Challenges in ensuring adoption and sustained use of improved cook stoves result can lead to over-crediting if traditional stoves continue to be used. • The use of biomass as a renewable energy sources is inconsistently accounted for under the CDM; the same region can have biomass power projects receiving credit for increasing biomass use and improved cook stove projects receiving credit for decreasing biomass use.

4.12.7. Recommendations for reform of CDM rules

We recommend revising the current methodologies as follows:

- Eliminate the use of the Water Boiling Test as a means of determining baseline emissions.
- Reconsider the use of default f_{NRB} factors based on the MAI approach.
- Revise the emission factor for the substitution of non-renewable biomass by similar consumers to one based solely on LPG.
- Explore options for incorporating temperature sensors in monitoring plans to improve reliable assessment of the adoption and sustained use of improved vs. traditional cook stoves in households.
- Review the use of biomass as an energy source under the CDM to ensure consistent accounting across project types and regions. The f_{NRB} should be considered in improved cook stove projects, as well as modern biomass energy projects to confirm that projects are not contributing to loss of carbon stocks. The CDM EB needs to provide justification for how both biomass energy and improved cook stove projects can be approved within a sub-region.

4.13. Efficient lighting

4.13.1. Overview

For energy efficient lighting, we focus our analysis on the replacement of incandescent electrical bulbs with more efficient electric lighting, such as Compact Fluorescent Lamps (CFLs) or Light Emitting Diode (LED) lamps. This includes all projects registered under AM0046⁷⁹ and AMS II.J⁸⁰

⁷⁹ [Distribution of efficient light bulbs to households --- Version 2.0.](#)

⁸⁰ [Demand-side activities for efficient lighting technologies --- Version 6.0.](#)

methodologies as well as projects registered under AMS II.C⁸¹ that are labelled as 'lighting' and 'lighting in service' in UNEP DTU (2014).⁸² This technology category was a late starter in the CDM – in mid-2010 there were only half a dozen registered projects and 3 registered PoAs. Recent growth in PoAs, particularly with larger PoAs, indicates a higher potential in the future – even beyond the current project activity and PoA pipeline. Energy efficient lighting projects are typically implemented by an entity (often public sector or linked to a utility) that distributes energy efficient lamps for free or for a nominal fee, and collects and disposes of the incandescent bulbs that have been displaced.

4.13.2. Potential CER volume

For CDM project activities, the 40 projects registered by the end of 2013 state that they will produce 1.4 million CERs per year. This would be 10.3 million CERs in the period of 2013 to 2020. However, the issuance success for the largest project activity, which is the only project using the large-scale methodology, amounted to only 12% in the first monitoring period. This could be related to the time required for the CFL distribution programme to reach full scale, however, and does not necessarily mean that other projects will have similar issuance rates (or that this rate will not increase over time). Other projects have been much more successful, but are considerably smaller. Project activities are dominated by a stream of small-scale projects in India and a single large-scale project in Ecuador – the only registered large-scale energy efficient lighting project – which account for almost 80% of the expected CERs. More than 80% of the small-scale projects use AMS II.J, which was designed specifically as a simplified approach to energy efficient lighting.

The largest volume of CERs for energy efficient lighting, however, could come from PoAs. Twenty-six PoAs had been registered for energy efficiency lighting by the end of 2013. Just from the CPAs already included in these registered PoAs as of the end of 2013, the volume of CERs is estimated by the project developers at 3.4 million per year, or two and a half times greater than for project activities. This could continue to grow, given that only four PoAs have more than one CPA. For PoAs, the main players are China, India, Mexico and Pakistan, with South Africa also hosting multiple PoAs (Table 4-10). The four PoAs with more than one CPA have large numbers of CPAs (e.g. 9 to 53). For some PoAs, the CPAs are delineated to have very similar emission reductions in each CPA (e.g. in Mexico, India, Bangladesh).

⁸¹ [Demand-side energy efficiency activities for specific technologies --- Version 14.0.](#)

⁸² This excludes one registered PoA under AMS II.C that focuses on street lighting and is labelled as sub-type "Street lighting".

Table 4-10: Number of energy efficient lighting PoAs and CERs by country and methodology

Country	Number of PoAs	Annual CERs (1,000)	CPAs per PoA	Annual CERs/CPA (1,000)	PoAs with >1 CPA
Bangladesh	1	124	9	14	1
China	14	443	1	32	
India	3	1,555	17	30	1
Kenya	1	31	1	31	
Mexico	1	607	25	24	1
Nigeria	1	29	1	29	
Pakistan	1	557	53	11	1
Senegal	1	4	1	4	
South Africa	3	80	1	27	
AMS-II.C.	6	668	5	22	
AMS-II.J.	20	2,762	6	21	
Total	26	3,431			4

Sources: UNEP DTU 2015b

All of the PoAs for lighting efficiency upgrades have moved to the newer methodology AMS II.J rather than AMS II.C (Table 4-10). No new energy efficient lighting PoAs have entered the pipeline since October 2012, and the new project activity pipeline largely stopped in January 2012, with only one new project activity starting validation in 2013 (in The Gambia).

4.13.3. Additionality

Because only one project activity uses the large-scale methodology, this entire technology area essentially uses SSC methodologies and additionality rules. For SSC projects and PoAs, additionality can be determined through several different routes: All SSC projects (or SSC CPAs within PoAs) must refer to the tool for “Demonstration of additionality of small-scale project activities” (Tool21, ver10.0). This includes the choice of using several different barriers to justify additionality (i.e. investment barrier, technology barrier, prevailing practice barrier, or other barriers). In addition, from July 2012, projects comprised entirely of units below 5% of the small-scale CDM threshold (i.e. 3000 MWh savings for energy efficiency) were considered automatically additional without any further justification. This new ‘positive list’ additionality argument has not been used by CDM project activities but has been used extensively by PoAs, as discussed further below. Most CDM project activities applying the SSC additionality tool cite investment barriers and use simple cost analysis to prove additionality (Table 4-11). This is because the organisations distributing the efficient lamps do not receive the energy savings, so they incur only costs without any revenue (other than a nominal fee from consumers in some cases).⁸³

As mentioned above, since July 2012, the tool for additionality of SSC activities has allowed automatic additionality based on a ‘unit threshold’ described as “project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-

⁸³ The organisations that charge a nominal fee would be receiving less than the wholesale cost of the CFL, so would lose money on each bulb even though there is nominal revenue. In theory, any programme implemented by an electric utility should not be able to use simple cost analysis because the utility has avoided power generation costs (and deferred capital costs) that are a benefit stream to the project. Even where the project is implemented by a utility (e.g. South Africa’s Eskom), this is not addressed because the unit threshold positive list is used to justify additionality.

scale CDM thresholds.” For energy efficiency, this threshold of 3000 MWh is roughly 46,000 CFLs. All projects and PoAs applying SSC methodologies may use this rule to qualify for automatic additionality.

Table 4-11: Additionality approaches used by efficient lighting CDM project activities

Additionality approach	Number of PAs	Total Annual CERs (1,000)
Investment barrier: Benchmark Analysis	2	71
Investment barrier: Investment Comparison Analysis	2	60
Investment barrier: Simple Cost Analysis	33	1.079
Investment barrier: Other	1	18
Positive list	2	44
Total	40	1.272

Sources: Authors' own compilation

Lighting PoAs have also made extensive use of this unit threshold for automatic additionality. A report by the UNFCCC Secretariat in mid-2014 (CDM-EB85-AA-A09) found that 28 of the registered lighting-related PoAs at that time had used either micro-scale or unit thresholds to qualify for automatic additionality. As an example, all 12 of the Chinese PoAs registered in December 2012 used the unit threshold for automatic additionality.

As one of the first ‘top-down’ large-scale methodologies, the EB published an energy efficiency lighting methodology in November 2013, which included a new approach for additionality demonstration:

- In countries with limited or no regulations supporting energy efficient lighting, as evidenced by a UNEP Global Lighting Map⁸⁴ survey of regulations and support for energy efficient lighting, CFLs are automatically additional.⁸⁵
- For other countries (i.e. those with more regulatory support), the “Tool for the demonstration and assessment of additionality” must be used, with an investment analysis and common practice analysis. While the investment analysis may still use simple cost analysis (which would mean that almost all projects would be additional), any country with a higher than 20% penetration of CFLs is not additional under the common practice test.

This new approach essentially restricted CFL CDM projects to countries with limited regulatory support or low market penetration. Given that there are no new projects or PoAs entering the pipeline, however, this more recent methodology has not yet had an impact.

In November 2014, AMS II.J was also revised to only allow for automatic additionality for CFLs when there were limited or no regulations to support energy efficient lighting. However, for countries in which there is significant support for energy efficient lighting, the methodology says that additionality should be demonstrated using the latest version of the “Guidelines on the demonstration of additionality of small-scale project activities”. This difference is critical, however, because any project participant may simply use the unit threshold in the “Guidelines on the demonstration of

⁸⁴ <http://map.enlighten-initiative.org/>.

⁸⁵ Countries coloured red on the map have limited or no support for energy efficient lighting.

additionality of small-scale project activities” to guarantee automatic additionality, whatever the market penetration in the host country.

The main concern with the additionality of energy efficient lighting in the CDM is whether some activities – at least projects involving CFLs and fluorescent tubes – were already common practice at the time of registration and therefore not additional. The use of micro-scale or unit threshold positive lists means that project activities and PoAs do not have to address this common practice issue at all when using the SSC methodologies. In other words, using the SSC methodologies would be a way of circumventing the higher stringency of the new large-scale methodology. Projects could simply define the size of each CPA in a way that they qualify as automatically additional, whatever the regulations and market penetration in the host country. To evaluate the additionality of the existing pipeline, it is useful to consider the two criteria from AM0113 and the revised AMS II.J: regulatory support and market penetration.

According to the ‘en.lighten’ initiative’s Global Lighting Map referenced in the methodologies, regulatory support for efficient lighting is widespread, but varies greatly by country (Figure 4-9). For the countries with the most CDM PoA activity, the level of support is generally strong:

- China has already banned incandescent lighting⁸⁶ and implemented large state subsidy programmes since 2006.⁸⁷
- India does not have a ban on incandescent bulbs, but does have awareness-raising programmes, energy service company initiatives, and consumer financing options.
- Pakistan’s minimum energy performance standards also still allow incandescent bulbs, but the country has awareness-raising programmes, bulk procurement and tax incentives.
- South Africa has announced that incandescent bulbs will be phased out by 2016⁸⁸, and has testing and certification facilities. More importantly, the national utility, Eskom, distributed 30 million free CFLs between 2002 and 2010.⁸⁹
- A regional report for Latin America on the en.lighten initiative’s website notes that a Mexican regulation was passed in December 2010 prohibiting the sale of 100 watt and higher incandescent lamps for the residential sector after December 2011, and similar bans for 75 watt as of December 2012 and 40-60 watt as of December 2013.⁹⁰ The Mexican PoA was registered in July 2009, which preceded the passing of these regulations.
- In terms of their rating on minimum energy performance standards by the Global Lighting map, all of the countries with PoAs except Kenya and Malawi are orange (some/in progress) or green (advanced). This means that, in terms of the new large-scale methodology (AM0113), projects in all of the countries except Kenya and Malawi would not be automatically additional, but require the use of the additionality tool with investment analysis and the common practice threshold of 20%.

⁸⁶ Imports and sales of 100-watt-and-higher incandescent lamps are banned from 1 October 2012, 60-watt-and-above from 1 October 2014, and 15 watts or higher from 1 October 2016 http://www.chinadaily.com.cn/china/2011-11/04/content_14039321.htm.

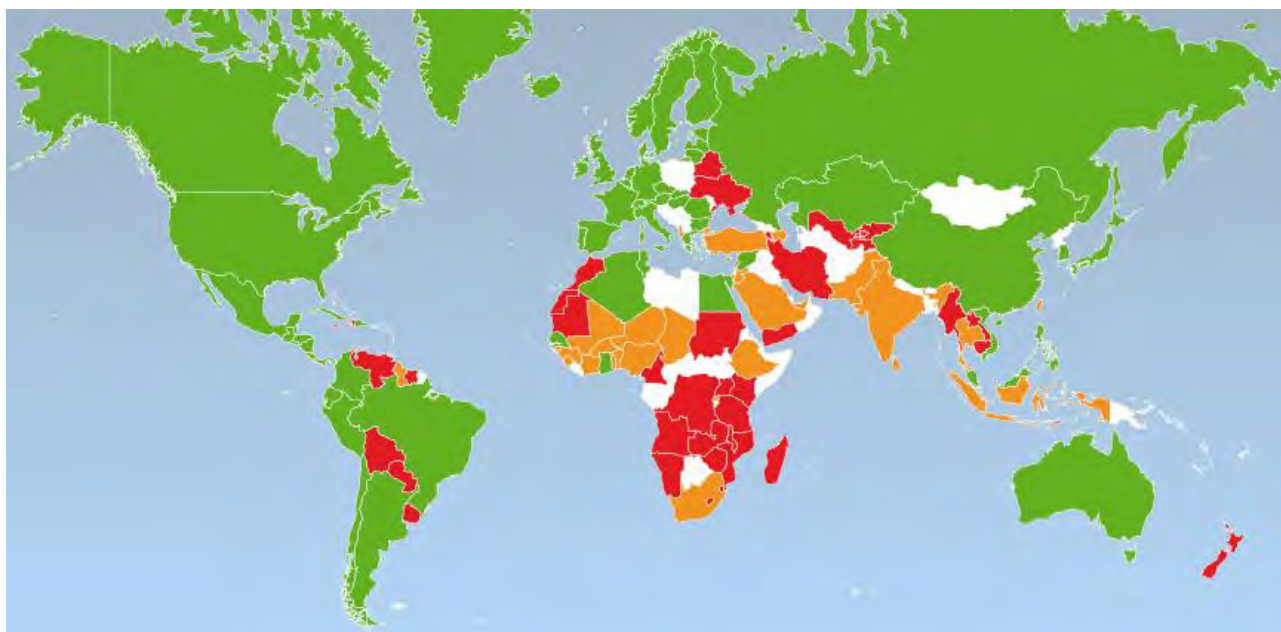
⁸⁷ http://www.sdpc.gov.cn/zjgx/t20080508_210093.htm.

⁸⁸ <http://www.thegef.org/gef/content/phasing-out-inefficient-lighting-combat-climate-change-south-africa-announces-national-phase>.

⁸⁹ http://www.eskom.co.za/OurCompany/SustainableDevelopment/ClimateChangeCOP17/Documents/The_Eskom_National_Efficient_Lighting_Programme_Compact_Fluorescent_Lamps_Clean_Development_Mechanism_Project.pdf.

⁹⁰ <http://www.enlighten-initiative.org/portals/0/documents/country-support/regional-workshops/Regional%20Report%20LA%20&%20C%20Final%20Eng..pdf>. The reference is to regulation “NOM- 028 – ENER – 2010 Energy Efficiency of Lamps for General Use”.

Figure 4-9: Minimum energy performance standards for lighting technologies



Notes: Green = Advanced/in place, Orange=In progress, Red=few/limited, white=no information available

Sources: <http://map.enlighten-initiative.org/>

In terms of assessing common practice, the available evidence suggested that CFLs are likely already common practice in most key CDM countries, and LEDs may be so in the next few years, though not in the poorest countries. The main CDM countries have the following market information:

- According to the “Regional Report on the Transition to Efficient Lighting in South Asia”⁹¹ prepared by the Tata Energy Research Institute in 2014, the market share of CFLs in India amounted to 29% in 2012-2013. Three of the four Indian PoAs were registered in late 2012, while one was registered in early 2010. In addition, for the largest PoA – which was registered in 2010 and has 50 CPAs – the PoA DD states that, “[t]he penetration share of incandescent lamps for lighting in commercial and residential sector put together is thus nearly 80% in India.”⁹² The market share for CFLs, therefore, was almost certainly above 20% when the PoAs were registered.
- In China, a 2012 McKinsey & Company report estimates the penetration of LEDs (the more expensive alternative to CFLs) as 12% in 2011, rising to 46% by 2016. The report also notes that, “CFL is still the dominant technology in the residential segment.”⁹³ This means that, at the time of registration of the PoAs, the market share of CFLs was almost certainly above 20%. China does not have any LED PoAs yet. If they were proposed, AMS II.J and AM0113 both consider LED lamps automatically additional in all countries until at least the end of 2016. Given the McKinsey projections presented above, automatic additionality for LEDs in China would not be appropriate.

⁹¹ <http://www.enlighten-initiative.org/Portals/0/documents/country-support/Regional%20Report%20on%20the%20Transition%20to%20Efficient%20Lighting%20in%20South%20Asia.pdf>.

⁹² <http://cdm.unfccc.int/ProgrammeOfActivities/gotoPoA?id=CZ59J1XMR8K4ELUS6WY3BA0IVTGQ2F>.

⁹³ http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/automotive%20and%20assembly/lighting_the_way_perspectives_on_global_lighting_market_2012.ashx.

- The large PoA in Mexico states in the PoA DD that CFL penetration in 2007 was already at 20%, while the PoA was registered in June 2009.⁹⁴
- In South Africa, even before the start of the Eskom free CFL distribution programme, the market share of CFLs was estimated at 7% in 2002 (Nkomo 2005). With 30 million CFLs distributed after this time,⁹⁵ in a country with less than 10 million households, the penetration of efficient lighting was almost certainly well above 20% when Eskom registered their CDM project activity and PoAs in 2012.
- For Pakistan, the “Regional Report on the Transition to Efficient Lighting in South Asia” cited above estimates the CFL market share at 8%, but also notes that linear fluorescent lamps make up 32% of the market.
- For Bangladesh, the same report puts the CFL market share at 25%, with linear tube fluorescent lamps at 18%. This market share could be for 2013 and the PoA was registered in May 2011, so there is a reasonable likelihood that the market share of CFLs was 20% at the time of registration.

This information suggests that the largest CDM PoA countries for energy efficient lighting would not pass the common practice test if the large-scale AM0013 methodology were applied, and so these PoAs would not qualify as additional. Bangladesh, China, India, South Africa and Mexico account for almost 80% of the expected CERs from PoAs, and yet these countries were likely above the 20% market share for CFLs when the PoAs were registered.

For off-grid lighting (AMS III.AR), the situation is quite different. Access to electricity in rural households in Sub-Saharan Africa, for example, is less than 10% (IEA et al. 2010; Legros et al. 2009). Between 2010 and 2015, the estimated number of unelectrified households in Africa was estimated to grow from 110 million to 120 million (Dalberg Global Development Adv. 2010). The off-grid solar lamp market is expanding to address the 1.5 billion people who do not (and, in many cases, will not) have access to electricity (IFC 2012). While solar lantern and solar kit prices are decreasing, they still face major barriers in terms of distribution challenge, upfront costs (and lack of consumer financing), and successful business models for scaling up (ESMAP 2013; IFC 2012).

Assessing the economics of energy efficient lighting faces the classic problem of ‘split incentives’ (Spalding-Fecher et al. 2004). From an economic point of view, upgrades to energy efficient electric lighting are unquestionably economically beneficial (i.e. have large positive IRRs) (McKinsey & Company 2009) but the benefits do not accrue to those who pay for the additional costs if the project is funded by outside agencies. The economics of efficient lighting are more likely to be driven by electricity prices than carbon prices. For example, a 15 W CFL replacing a 60W incandescent lamp operated 3.5 hours per day could save 57 kWh per year. With a relatively carbon-intensive grid (e.g. 0.8 tCO₂/MWh), this would be 0.05 tCO₂e savings per year. Electricity prices to the consumer in developing countries vary widely, from \$50/MWh in heavily subsidized economies to more than \$170/MWh in more competitive emerging economies (EIA 2010; Winkler et al. 2011). This means an energy savings of \$2.87 to \$9.77/year. CFL costs have also declined rapidly, with current costs of \$1.50-\$2.50 in many countries (UNEP 2012). This would mean a typical payback period of much less than one year, before any carbon revenue was received. At current CER prices, carbon revenue would be less than two cents per year only, while at \$3-5/CER, revenue would be \$0.15-0.25, or less than 5% of energy savings.

⁹⁴ http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/17BH6AJX524TYQUZF8KGCWV3OIPSE9/view Annex 3.

⁹⁵ http://www.eskom.co.za/OurCompany/SustainableDevelopment/ClimateChangeCOP17/Documents/The_Eskom_National_Efficient_Lighting_Programme_Compact_Fluorescent_Lamps_Clean_Development_Mechanism_Project.pdf.

In summary, CDM rules on additionality of efficient lighting projects vary considerably. Using market penetration and regulatory support as indicators for the likelihood seems a reasonable approach. The large-scale AM0113 methodology uses market penetration and regulatory support as indicators for demonstrating additionality; this approach seems reasonable and reflects the varying circumstances of host countries. AM0046 may provide for a suitable alternative by monitoring the market penetration of CFLs and LEDs in a control group outside the project boundary; however, the complexity and cost of monitoring under this methodology means that only one project has even chosen to utilise it – so the additionality approaches may not be relevant for the overall impact of this project category. In contrast, under small-scale methodologies, including the revised AMS II.J, this project type is, in practice, considered automatically additional, even if the use of CFLs is required by regulations and is widespread. However, for countries with regulations that have phased out incandescent bulbs or large subsidy programmes for CFLs, these existing registered projects are unlikely to be additional. If we take the 20% market share used in AM0113 as the point at which CFL programmes are no longer likely to be additional, then this would apply to most of the current CDM pipeline for energy efficient lighting.

4.13.4. Baseline emissions

In AMS II.J, AM0113 and AMS II.C (when used for lighting) the baseline is simply the use of the existing incandescent lamps – those which are collected and replaced within the project boundary.⁹⁶ Both AMS II.J and AM0113 take similar approaches, where emissions reductions are related to the difference in power between a CFL and baseline bulb, operating hours, lamp failure rates, a ‘net-to-gross’ adjustment, and the grid emissions factor (taking technical losses into account).⁹⁷ As a default, 3.5 operating hours per day are assumed. If project participants want to use operating hours greater than 3.5 per day, they must conduct a once-off survey at the start of the project to justify this. The lamp failure rates are also based on periodic surveys of the first group of bulbs installed, up to the end of their rated life. The methodologies require project participants to explain how they will collect and destroy baseline lamps. For off-grid lighting, an innovative ‘deemed consumption’ approach assigns a standard emissions reduction to each off-grid lighting unit, based on the fossil fuel alternative. The parameters and assumptions are conservative. Overall, the approaches to baseline emissions for efficient lighting are straightforward and conservative, and the improvements over the last two years have also simplified or clarified many of the sampling procedures.

4.13.5. Other issues

At 3-5 hours of use per day, a typical CFL would last anywhere from 3 to 10 years. This means that a crediting period of 10 years is almost certainly too long, unless the CDM project guarantees free replacements throughout the programme or restricts crediting to the measured life. The latter approach has been adopted under the CDM. Emission reductions do not accrue once the lamp failure rate reaches 100%, so if all lamps fail before the end of the crediting period and are not replaced, then no CERs would be issued. These provisions seem appropriate.

⁹⁶ AM46 also includes the possibility of some efficient lighting in the baseline, as a form of “autonomous efficiency improvement”, but this methodology has only been used once and is unlikely to be used in the future.

⁹⁷ AMS II.C is not so specific, because the guidance was for all energy efficiency technologies, but the approach elaborated by the project participant would essentially be the same.

4.13.6. Summary of findings

Additionality	<ul style="list-style-type: none"> Granting automatic additionality under small-scale methodologies to all energy efficient lighting programmes in the past was highly problematic because there were large PoAs in countries in which the move away from incandescent bulbs was well underway; the new large-scale AM0113 methodology appropriately addresses these problems but is not mandatory, while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes, so it is unlikely that the large-scale methodology will be used. In many countries with lower income or less regulatory support, however, efficient lighting still faces major barriers, even if it is potentially economic beneficial, and so projects may need the support of the CDM to be implemented; these projects currently form a very small part of the project pipeline but could grow in the future.
Over-crediting	<ul style="list-style-type: none"> Over-crediting is unlikely, given the robust monitoring procedures.
Other issues	<ul style="list-style-type: none"> None

4.13.7. Recommendations for reform of CDM rules

AMS II.J should be revised so that CFL programmes in countries with significant regulatory support may use the tool for “Demonstration of additionality of small-scale project activities” but may not use the paragraph referring to automatic additionality based on small unit size.

5. How additional is the CDM?

Based on the detailed analysis of individual project types in the previous chapter, this chapter provides an overall assessment of the environmental integrity of the CDM project portfolio available for the second commitment period of the Kyoto Protocol. Table 5-1 provides an overview of the summary of findings for each of the analyzed project types.

Table 5-1: Evaluation of project types

Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
HFC-23 (up to version 5)	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Risk of perverse incentives 	<ul style="list-style-type: none"> None 	Medium
HFC-23 (version 6)	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Risk of perverse incentives largely addressed Ambitious baseline could lead to under-crediting (net mitigation benefit) 	<ul style="list-style-type: none"> Low CER prices could jeopardize continued operation Emissions could be addressed through Montreal Protocol 	High
Adipic acid	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Most recent methodology could lead to slight under-crediting Leakage could lead to significant over-crediting in times of higher CER prices 	<ul style="list-style-type: none"> None 	Medium
Nitric acid	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Most recent methodologies lead to under-crediting Overall, little risks of over-all over-crediting 	<ul style="list-style-type: none"> None 	High
Wind power	<ul style="list-style-type: none"> CER revenue has only limited impact on profitability Investment costs decreased significantly in last years In some cases competitive with fossil generation Support schemes Widespread in many countries 	<ul style="list-style-type: none"> Methodological assumptions may lead to both over- and under-crediting 	<ul style="list-style-type: none"> None 	Low
Hydro power	<ul style="list-style-type: none"> Common practice in many countries CERs have only moderate impact on profitability Competitive with fossil generation in many cases 	<ul style="list-style-type: none"> Methodological assumptions may lead to both over- and under-crediting; over the lifetime of the project likely under-crediting 	<ul style="list-style-type: none"> Methane emissions from reservoirs may be important and may not be fully reflected by CDM methodologies 	Low
Biomass power	<ul style="list-style-type: none"> Significant impact of CER revenues on profitability for projects claiming methane avoidance Competitive with fossil generation in many cases Support schemes 	<ul style="list-style-type: none"> Demonstration of biomass decay/abundance of biomass is key Risk of exaggerated claims of anaerobic decay 	<ul style="list-style-type: none"> None 	Medium

Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
Landfill gas	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Default assumptions for the rate of methane captured historically have the potential to overestimate emission reductions Default soil oxidation rates may underestimate emission reductions for uncovered landfills in humid subtropical and tropical regions Perverse incentives for project developers to increase methane generation 	<ul style="list-style-type: none"> Perverse incentives for policy makers not to pursue less GHG intensive waste treatment methods 	Medium
Coal mine methane	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Potential concerns regarding increased mining 	<ul style="list-style-type: none"> Potential perverse incentives to dilute methane in order to avoid that abatement is required by regulations 	Medium
Waste heat recovery	<ul style="list-style-type: none"> CER revenues small compared to fossil fuel cost savings Future fuel cost savings uncertain Widespread in many countries 	<ul style="list-style-type: none"> Brownfield: risks for inflated baselines Greenfield: modelling uncertain Plant operation under the project different to baseline 	<ul style="list-style-type: none"> None 	Low
Fossil fuel switch	<ul style="list-style-type: none"> Use of barrier analysis allowed for small-scale projects not appropriate Investment analysis insufficient as choice of fuel depends not only on prices CER revenues have a small impact 	<ul style="list-style-type: none"> Default values for upstream emissions not appropriate 	<ul style="list-style-type: none"> None 	Low

Efficient cook stoves	<ul style="list-style-type: none"> CER revenues are insufficient to fully cover project costs Additionality questionable in urban areas 	<ul style="list-style-type: none"> Fraction of NRB likely to be overestimated Water boiling test not appropriate Emission intensity factors of fossil fuel likely underestimate emissions relative to wood-fuel used in the baseline Emissions factors used for suppressed demand are unrealistic Unrealistic assumptions for charcoal use Over-crediting if traditional stoves continue to be used 	<ul style="list-style-type: none"> Inconsistent accounting: CDM credits in the same region both reduction and increase of biomass use 	Low
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Project type	Additionality ¹⁾	Over-crediting ²⁾	Other issues	Overall environmental integrity ³⁾
Efficient lighting (AMS II.C AMS II.J)	<ul style="list-style-type: none"> Shift to EE lighting well underway and/or mandates in most common PoA countries, and PoAs allowed to use SSC additionality 'loophole' 	<ul style="list-style-type: none"> Unlikely 	<ul style="list-style-type: none"> None 	Low
Efficient lighting (AM0113, AM0046)	<ul style="list-style-type: none"> Likely to be additional 	<ul style="list-style-type: none"> Unlikely 	<ul style="list-style-type: none"> None 	High

Notes:

1) High/medium/low likelihood of projects being additional under current rules;

2) High/medium/low likelihood of avoiding over-crediting under current rules;

3) High/medium/low likelihood of emission reductions being additional and not over-credited under current rules.

Sources: Authors' own compilation

Overall, the table shows considerable differences between project types. Most energy-related project types (wind, hydro, waste heat recovery, fossil fuel switch and efficient lighting) are unlikely to be additional, irrespectively of whether they involve the increase of renewable energy, efficiency improvements or fossil fuel switch. An important reason that these projects types are unlikely to be additional is that for them the revenue from the CDM is small compared to the investment costs and other cost or revenue streams, even if the CER prices would be much higher than today. In addition, technological progress was much faster than expected, so that investment and generation costs have fallen considerably. Moreover, some project types are, in many instances, economically attractive (e.g. waste heat recovery, fossil fuel switch, hydropower), or supported through policies (e.g. wind power, efficient lighting), or mandatory due to regulations (e.g. efficient lighting). Some of these project types also have a medium likelihood of overestimating emission reductions, mainly due to risks of inflated baselines.

Industrial gas projects (HFC-23, adipic acid, nitric acid) can generally be considered likely to be additional as long as they are not promoted or mandated through policies. They use end-of-pipe-technology to abate emissions and thus do not generate revenues other than CERs. HFC-23 and adipic acid projects triggered strong criticism because of their relatively low abatement costs, which provided perverse incentives and generated huge profits for plant operators. In the case of HFC-

23, perverse incentives were addressed with the adoption of version 6 of AM0001, which uses an ambitious baseline that could lead to a net mitigation benefit. Similarly, concerns with perverse incentives for nitric acid plant operators not to use less GHG-intensive technologies were addressed. With regard to adipic acid projects, the risks of carbon leakage were not addressed.

Methane projects (landfill gas, coal mine methane) also have a high likelihood of being additional. This is mainly because carbon revenues have, due to the GWP of methane, a relatively large impact on the profitability of these project types. However, both project types face issues with regard to baseline emissions and perverse incentives and may thus lead to over-crediting.

Biomass power projects have a medium likelihood of being additional since their additionality very much depends on the local conditions of individual projects. In some cases, biomass power can already be competitive with fossil generation while in other cases domestic support schemes provide incentives for increased use of biomass in electricity generation. However, where these conditions are not prevalent, projects can be additional, particularly if CER revenues for methane avoidance can be claimed. Biomass projects also face other issues, in particular with regard to demonstrating that the biomass used is renewable.

The additionality efficient lighting project using small-scale methodologies is highly problematic because there were large PoAs in countries in which the move away from incandescent bulbs was well underway. The new methodologies address these problems but they are not mandatory and the small-scale methodologies are while the remaining small-scale methodology could still allow for automatic additionality for CFL programmes.

For cook stove projects, CDM revenues are often insufficient to cover the project costs and to make the project economically viable. In urban areas, however, the additionality of these project types is questionable. Cook stove projects are also likely considerably over-estimate the emission reductions due to a number of unrealistic assumptions and default values.

Based on these considerations we can estimate to which extent the CDM is likely to deliver additional emission reductions during the period of 2013 to 2020 (Table 5-2).

Table 5-2: How additional is the CDM?

	CDM projects			Potential CER supply 2013 to 2020		
	Low	Medium	High	Low	Medium	High
	... likelihood of emission reductions being real, measurable, additional					
	No. of projects			Mt CO ₂ e		
HFC-23 abatement from HCFC-22 production						
Version <6		5			191	
Version >5			14			184
Adipic acid		4			257	
Nitric acid			97			175
Wind power	2.362			1.397		
Hydro power	2.010			1.669		
Biomass power		342			162	
Landfill gas		284			163	
Coal mine methane		83			170	
Waste heat recovery	277			222		
Fossil fuel switch	96			232		
Cook stoves	38			2		
Efficient lighting						
AMS II.C, AMS II.J	43			4		
AM0046, AM0113			0			0
Total	4.826	718	111	3.527	943	359

Sources: Authors' own calculations

Our analysis covers three quarters (76%) of the CDM projects and 85% of the potential CER supply during that period. 85% of the covered projects and 73% of the potential CER supply have a low likelihood of ensuring environmental integrity (i.e. ensuring that emission reductions are additional and not over-estimated). Only 2% of the projects and 7% of potential CER supply have a high likelihood of ensuring environmental integrity. The remainder, 13% of the projects and 20% of the potential CER supply, involve a medium likelihood of ensuring environmental integrity.

Has the performance of the CDM in terms of additionality improved over time? Several EB decisions have certainly improved the performance, particularly those which introduced ambitious baselines and/or addressed perverse incentives. However, Schneider (2007) estimated, "that additionality is unlikely or questionable for roughly 40% of the registered projects. These projects are expected to generate about 20% of the CERs". Schneider's methodological approach is not identical with the approach applied in this study but is, nevertheless, similar enough for a comparison of the overall results. Compared to earlier assessments of the environmental integrity of the CDM, our analysis suggests that the CDM's performance as a whole has anything but improved, despite improvements of a number of CDM standards. There are several reasons for this:

- The main reason is a shift in the project portfolio towards projects with more questionable additionality. In 2007, CERs from projects that do not have revenues other than CERs made up about two third of the project portfolio, whereas the 2013-2020 CER supply potential from these project types is only less than a quarter. This is mainly due the registration of many energy projects between 2011 and 2013, including both fossil and renewable projects, which represent the largest share of CDM projects and of potential CER supply today, many of which are unlikely to be additional. It can therefore be questioned whether the CDM is the appropriate incentive scheme for those project types, or more generally, whether these project types are appropriate for crediting schemes at all.

- A second reason is that the CDM EB not only improved rules but also made simplifications that undermined the integrity. For example, positive lists were introduced for many technologies, for some of which the additionality is questionable and some of which are promoted or required by policies and regulations in some regions (e.g. efficient lighting). Another example is biomass residue projects, for which requirements to demonstrate that the biomass is available in abundance were strongly simplified, making an over-estimation of emission reductions more likely.
- A third reason is that the CDM EB did not take effective steps to exclude project types with a low likelihood of additionality. While positive lists were introduced, project types with more questionable additionality were not excluded from the CDM. The common practice test is not effective as it stands. Standardized baselines can be optionally used as an alternative to project-specific baselines, which provides a further avenue for demonstrating additionality but does not reduce the number of projects wrongly claiming additionality. In conclusion, the improvements to the CDM mainly aimed at simplifying requirements and reducing the number of false negatives (projects that are additional but do not qualify under the CDM) but did not address the false positives (projects that are not additional but qualify under the CDM).

Our analysis of the environmental integrity of the CDM has focused on the quality of CERs in terms of ensuring emission reductions that are additional and not over-credited. The overall environmental outcome of the CDM is, however, also influenced by several overarching and indirect effects:

- **Awareness raising and capacity building:** The CDM has drawn attention to climate change and to options of how it can be mitigated and thus contributed to the issue of climate change being better understood and taken more seriously in many parts of the world. In this way it has helped to pave the way towards the global agreement achieved at COP 21 in Paris in December 2015.
- **Technological innovation:** The CDM has helped to spread and reduce costs of many GHG mitigation technologies such as renewable energy technologies or technologies to avoid methane emissions in many developing countries. This may have helped developing countries to avoid locking in carbon-intensive technologies. The increased application of these technologies has contributed to reducing their total cost, and the CDM has contributed to building the capacity on how these technologies can domestically be applied in many developing countries.
- **Length of crediting periods:** Certain projects may continue their operation beyond their crediting period and will not receive credits for the respective GHG reductions. This effect has been estimated to have a significant potential for under-crediting (Spalding-Fecher et al. 2012). However, over time the respective technologies often become economically viable without support and thus the common practice in many circumstances. The CDM may thus have contributed to advancing an investment, which would anyhow be conducted some years later, so that even the additionality of CERs generated in the late years of a crediting period could be questioned.
- **Rebound effects:** For CDM project developers and host countries, CER revenues are similar to subsidies, which often lower the cost of the product or service provided (e.g. electricity, cement, transportation), thereby inducing greater demand for the product or service. In contrast, carbon taxes or auctioning of allowances under the ETS generally provide incentives to reduce the demand for products or services. Calvin et al. (2015) show that ignoring such system-wide rebound effects in the power sector can lead to significant over-

crediting compared to the actual reductions at system level. The overall mitigation outcome of crediting could be systematically over-estimated, even if projects are fully additional and the direct GHG emission impact of a project is quantified appropriately. This is mainly because credits subsidize the deployment of technologies with lower emissions instead of penalising the use of more emitting technologies and because CDM methodologies draw the boundary around a project and do not consider the wider rebound effects.

- **Perverse policy incentives:** In some instances, the CDM may provide an incentive to governments not to implement domestic policies to address emissions. For example, policy makers may have disincentives to introduce regulations requiring the capture of landfill gas or to further pursue landfilling instead of less GHG-intensive waste treatment methods, since they would otherwise lose revenues from CERs.

All these effects somehow influence the environmental outcome of the CDM, partly for the better and partly for the worse. The overall effect can hardly be determined. However, it is unlikely that these overarching and indirect effects fully compensate for the overall low environmental integrity of many projects and CERs. On the contrary, in a forward-looking perspective, comparing the situation in which the CDM continues to be used with a situation in which this would not be the case, it is rather likely that these overarching effects further undermine the environmental outcome of the CDM overall.

The result of our analysis suggests that the CDM still has fundamental flaws in terms of environmental integrity. It is likely that the large majority of the projects registered and CERs issued under the CDM are not providing real, measureable and additional emission reductions. Therefore, the experiences gathered so far with the CDM should be used to improve both the CDM rules for the remaining years and to avoid flaws in the design of new market mechanisms being established under the UNFCCC. In the following chapters we summarise how the existing CDM should be improved (Chapter 6) and what can be learned from the CDM experience for the future of market mechanisms in general (Chapter 7).

6. Summary of recommendations for further reform of the CDM

The recommendations for the further reform of the CDM can be distinguished according to improvements of the general rules and approaches how to determine additionality and to project type-related recommendations.

6.1. General rules and approaches for determining additionality

As mentioned above, for an additionality test to function effectively, it must be able to assess, with high confidence, whether the CDM was the deciding factor for the project investment. However, additionality tests can never fully avoid wrong conclusions. They cannot fully reflect the complexity of investment decisions. Additionality tests always look at part of the full picture and use simplified indicators, such as economic performance or market penetration, to make a judgment on whether or not a project is truly additional. Information asymmetry between project developers and regulators, combined with the economic incentives for project developers to qualify their project as additional, are a major challenge. The key policy question is how confident regulators should be that a project is additional. In other words, how should the number of false positives (projects that qualify as additional but are not) and false negatives (projects that are additional but do not pass the test) be balanced? We assessed the current additionality tests from the perspective that a high degree of confidence is required. The main reason is that the implications of false positives are much more severe than the implications of false negatives. A false positive leads to both an increase in global

GHG emissions and higher global costs of mitigating climate change, whereas a false negative does not affect global GHG emissions but only leads to higher costs of mitigating climate change (Schneider et al. 2014).

In Chapter 3 we thoroughly scrutinised the four main approaches used to determine additionality. Our analysis shows:

- **Prior consideration** is a necessary and important but insufficient step for ensuring additionality of CDM projects. This step works largely as intended (Section 3.1.4).
- The subjective nature of the **investment analysis** limits its ability to assess with high confidence whether a project is additional. It is possible that improvements could further decrease this subjectivity, e.g. by applying more complicated tests to assess the financial performance of the project. However, especially for project types in which the financial impact of CERs is relatively small compared to variations in other parameters such as large power projects, doubts remain as to whether investment analysis can provide a strong 'signal to noise' ratio (Section 3.2.4).
- To reduce the subjectivity of the **barrier analysis**, the '*Guidelines for objective demonstration and assessment of barriers*' require that barriers are monetized to the extent possible and integrated in the investment analysis. As a result of this, the barrier analysis has lost importance as a stand-alone approach of demonstrating additionality. However, barriers which are not monetized remain subjective and often difficult to verify by the DOEs (Section 3.4.4).
- In general, the **common practice analysis** can be considered a more objective approach than the barriers or investment analysis due to the fact that information on the sector as a whole is considered rather than specific information of a project only. It reduces the information asymmetry inherent in the investment and barrier analysis (Section 3.3.4). In this regard, expanding the use of common practice analysis could be a reasonable approach to assessing additionality more objectively. However, the presented analysis shows that the way common practice is currently assessed needs to be substantially reformed to provide a reasonable means of demonstrating additionality. Moreover, when expanding its use, it is important to reflect that market penetration is not a good proxy for all project types for the likelihood of additionality. The fact that few others have implemented the same project type is only an indication of the actual attractiveness. It should thus be only applied to those project types for which market penetration is a reasonable indicator.

Against this background we recommend that

- the **prior consideration** grace period for notification after the start of a CDM project should be shortened from 180 to 30 days to reduce the risk that projects apply for the CDM having only learned about this option after the start of the project,
- the **common practice analysis** is significantly reformed and receives a more prominent role in additionality determination,
- the **investment analysis** is excluded as an approach for demonstrating additionality for projects types for which the 'signal to noise' ratio is insufficient to determine additionality with the required confidence; while for those project types for which investment analysis would still be eligible, project participants must confirm that all information is true and accurate and that the investment analysis is consistent with the one presented to debt or equity funders, and

- the **barrier analysis** is entirely abolished as a separate approach in the determination of additionality at project level (though it may be used for determining additionality of project types); barriers which can be monetized should be addressed in the investment analysis while all other barriers should be addressed in the context of the reformed common practice analysis.

A prerequisite for expanding the use of the common practice analysis is significant improvements of its current shortcomings, most notably with regard to the following issues (Section 3.3.4):

- The project types and sectors covered by the CDM are very different in their technological and market structure. Determining what is deemed to be common practice must take into account these differences. Therefore, the 'one-size-fits-all' approach of determining common practice should be abandoned and be replaced by **sector or project-type specific guidance**, particularly with regard to distinguishing between different and similar technologies (appropriate level of dis-/aggregation) and with regard to the threshold for market penetration, which can have very different implications for the number of projects passing the test, depending on the features of the sectors or project types.
- The **technological potential** of a certain technology should also be taken into account in order to avoid that a project is deemed additional although the technological potential is already largely exploited in the respective country. However, results of studies on the technological potential depend strongly on their assumptions and may thus vary significantly. The exploitation rate should therefore only be considered one criterion among others in determining whether a technology is common practice; it should not form the only decisive criterion.
- The common practice analysis should at least cover the **entire country**. However, to ensure statistical confidence, the control group needs a minimum absolute number of activities or installations. If the observations in the host country do not exceed that minimum threshold, the scope needs to be extended to other countries (e.g. the neighbouring countries or the entire continent).
- Last but not least, all CDM projects should be included into the common practice analysis as a default, unless a methodology includes different requirements.

In addition to the above-mentioned improvements of general approaches for determining additionality, we recommend further improvements to key general CDM rules:

- **Renewal and length of crediting periods:** At the renewal of the crediting period, not merely the validity of the baseline but the validity of the baseline scenario should be assessed for CDM projects that are potentially problematic in this regard. This is the case if the baseline is the 'continuation of the current practice' or if changes such as retrofits could also be implemented in the baseline scenario at a later stage. Crediting periods of project types or sectors that are highly dynamic or complex such as urban transport systems or data centres should be limited to one single period of 10 years maximum. Moreover, generally abolishing the renewal of crediting periods but allowing a somewhat longer single crediting period for project types which require a continuous stream of CER revenues to continue operation (e.g. landfill gas flaring) may also be considered (Section 3.5.4).
- **Positive Lists:** Some of the positive lists are now reviewed regularly, and have a clear basis for determining whether a technology should still be included in the lists. This review of validity should also be extended to project types covered by the microscale additionality tool. In addition, positive lists must address the impact of national policies and measures to

support low emissions technologies (so-called E- policies). For positive lists to avoid the possibility of ‘false positives’ driven by national policies, some objective measure of renewable energy support may be needed as part of the evaluation process. A positive list that included renewables, for example, could be qualified by restricting its applicability to countries that did not have any support policies in place for that specific technology. Finally, to maintain environmental integrity of the CDM overall, positive lists should be accompanied by negative lists (Section 3.7).

- **Programmes of activities:** PoA rules allow that the total project size exceeds the small-scale or micro-scale thresholds while using the automatic additionality provision established for small-scale and micro-scale projects. This may increase the risk of registering non-additional projects. Reform of the CDM rules related to additionality for particular project types (Chapter 4) and positive lists (Section 3.7) will address any concerns about additionality of PoAs (Section 3.6.3). However, as long as these rules are not reformed accordingly, PoA have the potential to boost the number of non-additional project activities and CERs.
- **Standardized baselines:** These were introduced to reduce transaction costs while ensuring environmental integrity. In contrast to the general expectation, they do not increase the environmental integrity of the CDM. On the contrary, as long as they are not mandatory, once established, they lower the environmental integrity because they allow for increasing the number false positive projects. Therefore, their use should be made mandatory. Moreover, all CDM facilities should be included in the peer group used for the establishment of standardized baselines and clearer guidance needs to be provided for DNAs on how to determine the appropriate level for disaggregation. Finally, the practice of using the same methodological approach for the establishment of standardized baselines for all sectors, project types and locations should be abolished (Section 3.8).
- **Consideration of domestic policies (E+/E-):** The risk of undermining environmental integrity through over-crediting of emission reductions is likely to be larger than the creation of perverse incentives for not establishing E- policies. Therefore, adopted policies and regulations reducing GHG emissions (E-) should be included when setting or reviewing crediting baselines while policies that increase GHG emissions (E+) should be discouraged by their exclusion from the crediting baseline where possible (Section 3.9).
- **Suppressed demand:** In many cases, the Minimum Service Levels may be reached during the lifetime of CDM project. However, even if the suppressed demand does lead to some over-crediting, the overall impact is very small. An expert process should be established to balance the risks of over-crediting with the potential increased development benefits. In addition, the application of suppressed demand principles in methodologies could be restricted to countries in which development needs are highest and the potential for over-crediting is the smallest, such as LDCs (Section 3.10).

6.2. Project types

We note that even with ‘perfect’ rules for determining additionality as recommended in Section 6.1, many project types have fundamental problems with this determination. Drawing upon our findings for specific project types (Section 4), this section provides recommendations of which project types should remain eligible in the CDM. In doing so, we not only consider the environmental integrity under current rules, but also whether improvements of general or project type-specific rules could be implemented to ensure overall environmental integrity. We also include other considerations, such as whether the emission sources can be addressed more effectively by other policies.

Industrial gas projects: In contrast to conventional wisdom and their perception in the general public, our analysis shows that industrial gas projects provide for a high or medium environmental integrity. After issues related to perverse incentives have been successfully addressed through ambitious benchmarks, **HFC-23** and **nitric acid** projects now provide for a high degree of environmental integrity. They are very likely to be additional because they involve so-called 'end-of-the-pipe' technologies and do not have significant income other than CERs and because revenues from CERs have a large impact on the economic feasibility. Moreover, they partially use emission benchmarks as baselines which underestimate the actual emission reductions. The methodologies for HFC-23 and nitric acid projects have already been improved in the past and do not require further improvements (Sections 4.2.7 and 4.4.7). For **adipic acid**, the situation is different; this project type is also likely to be additional but concerns about carbon leakage due to high CER revenues have never been addressed. Adipic acid production is a highly globalised industry and all plants are very similar in structure and technology. A global benchmark of 30 kg/t applied to all plants would prevent carbon leakage, considerably reduce rents for plant operators, and allow the methodology to be simplified by eliminating the calculation of the N₂O formation rate (Section 4.3.7). Industrial gas projects provide for low cost mitigation options. Under current rules, HFC-23 and adipic acid projects may generate large rents for plant operators. These emission sources could therefore also be addressed through domestic policies, such as regulations or by including the emission sources in domestic or regional ETS, and help countries achieve their NDCs under the Paris Agreement. For example, China is introducing a domestic results-based finance policy aiming at incentivising HFC-23 emissions reductions. Parties to the Montreal Protocol also consider regulating HFC emissions. We therefore recommend that HFC-23 projects are not eligible under the CDM. A transition to address these emissions domestically may also be supported by bilateral or multilateral initiatives of (results-based) carbon finance.

Energy-related project types: Our analysis suggests that many energy-related project types provide for a low likelihood of overall environmental integrity, particularly **wind and hydropower** (Sections 4.5.7 and 4.6.7), **fossil fuel switch** (Section 4.11.7) and **supply-side energy efficiency project** types such as **waste heat recovery** (Section 4.10.7). The main reason for this assessment is that CER benefits are often relatively small compared to fuel cost savings, so that the impact of CER revenues on the economic feasibility is marginal (Section 2.4). Many projects are also supported through other policies, such as feed-in tariffs for renewable electricity or emerging ETSs. The costs for renewable power technologies are decreasing rapidly. In our assessment, the potential for addressing additionality concerns through improved tests are rather limited for these project types. Many projects are economically viable and even an improved investment analysis or common practice test may not be suitable to clearly distinguish additional from non-additional projects. We therefore recommend **that these project types should be no longer eligible in principle** under the CDM. However, in least developed countries, some project types, particularly wind and small-scale hydropower plants, may still face considerable technological and/or cost barriers (Section 4.5.3). These project types may thus remain eligible in least developed countries.

We recommend that some other energy-related project remain eligible if methodologies are improved. **Biomass power projects** can be competitive with fossil generation technologies under certain but not all circumstances. In cases in which power generation from biomass is not competitive with fossil generation technologies, CER revenues can have a significant impact on the profitability of a project, particularly if credits for methane avoidance are claimed as well. In these cases, the demonstration of abundance of biomass as well as of the claim that biomass is left to decay is key for avoiding any over-crediting of emissions. We therefore recommend that only biomass power projects avoiding methane emissions remain eligible under the CDM provided that the corresponding provisions in the applicable methodologies are revised appropriately (Section 4.7.7).

With regard **demand-side energy efficiency** project types with distributed sources – **cook stoves** and **efficient lighting** – we have identified concerns which question their overall environmental integrity. However, environmental integrity concerns could be addressed if cook stove methodologies were revised considerably, including more appropriate values for the fraction of non-renewable biomass (Section 4.12.7), and if approaches for determining the penetration rate of efficient lighting technologies as already established in AM0113 were made mandatory for all new projects and CPAs under these project types and the older methodologies were withdrawn (Section 4.13.7). As CER revenues can have a considerable impact and as barriers persist these projects, we recommend that they should remain eligible, subject to the improvements recommended.

Methane projects: Landfill gas and **coal mine methane** projects are likely to be additional. However, there are concerns in terms of over-crediting, which should be addressed through improvements of the respective methodologies, particularly by introducing region-specific soil oxidations factors and by requesting DOEs to verify that landfilling practices are not changed (Sections 4.8.7 and 4.9.7). For both project types, the CER revenues have a considerable impact on their economic performance. With regard to landfill gas, an important concern is that continued incentives for landfilling could delay the implementation of more sustainable waste management practices, such as recycling or composting. We therefore recommend that this project type only be eligible in countries that have policies in place to transition to more sustainable waste management practices.

Table 6-1 summarises our recommendations for the specific project types assessed above.

Table 6-1: CDM eligibility of project types

Project type	Environmental integrity under current rules	Environmental integrity if rules were improved	Recommendations
HFC-23	Medium / High	High	Not eligible
Adipic acid	Medium	High	Eligible (with benchmark of 30 kg / t AA)
Nitric acid	High	High	Eligible
Wind power	Low	Low	Not eligible
Hydropower	Low	Low	Not eligible
Biomass power	Medium	Medium / High	Eligible (projects avoiding methane emissions)
Landfill gas	Medium	Medium / High	Eligible (subject to transition arrangements)
Coal mine methane	Medium	Medium / High	Eligible
Waste heat recovery	Low	Low	Not eligible
Fossil fuel switch	Low	Low	Not eligible
Efficient cook stoves	Low	Medium / High	Eligible
Efficient lighting	Low / High	Medium / High	Eligible

Sources: Authors' own compilation

7. Implications for the future role of the CDM and crediting mechanisms

In this section, we consider the implications of our analysis for the future role of the CDM and crediting mechanisms generally. We situate these implications not only in the context of the CDM but also the Paris Agreement and draw general conclusions for the design of international crediting mechanisms under the Paris Agreement as well as crediting policies established at national level.

The CDM has provided many benefits. It has brought innovative technologies and financial transfers to developing countries, helped identify untapped mitigation opportunities, contributed to technology transfer and may have facilitated leapfrogging the establishment of extensive fossil energy infrastructures. The CDM has also helped to build capacity and to raise awareness on climate change. It also created knowledge, institutions, and infrastructure that can facilitate further action on climate change. Some projects have provided significant sustainable development co-benefits. Despite these benefits, after well over a decade of considerable experience, the enduring limitations of GHG crediting mechanisms are apparent.

- Firstly, and most notably, the elusiveness of additionality for all but a limited set of project types is very difficult, if not impossible, to address. Our analysis shows that many CDM project types are unlikely to be additional. Information asymmetry between project participants and regulators remains a considerable challenge. This challenge is difficult to address through improvements of rules. Further standardisation can be helpful for reducing transaction costs but has a limited scope, particularly within the CDM, for resolving additionality concerns. The scope for added standardisation is limited by the number of amenable project types and the wide variation of conditions across CDM host countries. Standardisation approaches have been most successful in regional crediting programs such as California or

Australia, where they have focused on a limited number of suitable and largely non-energy project types, such as landfills or coal mines.⁹⁸ The overall integrity of the CDM could only be improved significantly if the mechanism were limited to those project types that have a high likelihood of providing additional emission reductions. In our assessment, this would require excluding most of the current CDM project types and focusing mainly on projects that abate other GHGs than CO₂.

- Secondly, international crediting mechanisms involve an inherent and unsolvable dilemma: either they might create perverse incentives for policy makers in host countries not to implement policies or regulations to address GHG emissions – since this would reduce the potential for international crediting – or they credit activities that are not additional because they are implemented due to policies or regulations. This well-known dilemma has been discussed by the CDM EB without a resolution.
- Thirdly, for many project types, the uncertainty of emission reductions is considerable. Our analysis shows that risks for over-crediting or perverse incentives for project owners to inflate emission reductions have only partially been addressed. It is also highly uncertain how long projects will reduce emissions, as they might anyhow be implemented at a later stage without incentives from a crediting mechanism – an issue that is not addressed at all under current CDM rules.
- A further overarching shortcoming of crediting mechanisms is that they do not make polluters pay but rather subsidize the reduction of emissions. This lowers the cost of the product or service, inducing rebound effects that are not considered under CDM rules and that lead to over-crediting. Most of these shortcomings are inherent to using crediting mechanisms, which questions the effectiveness of international crediting mechanisms as a key policy tool for climate mitigation.

It should be noted that the results of the analysis provided here for the CDM are to a large extent also relevant and valid for other international carbon offset or crediting programs, such as the Japanese Joint Crediting Mechanism (JCM), the Climate Action Reserve (CAR), the Verified Carbon Standard (VCS) or the Gold Standard (GS). The results are also relevant for the mechanisms to be implemented under Article 6 of the Paris Agreement, any mechanism to be used for compliance under the Carbon Offset and Reduction Scheme for International Aviation (CORSIA) and to a certain extent for the Joint implementation (for an overview see Kollmuss et al. 2015a). Even though the programs differ in many aspects, generally speaking, the CDM has been the origin and the role model for these offset programs. In particular, the CDM's approaches to additionality testing and baseline setting have served as the main blueprint for most other programs. With the aim of reducing transaction costs, rules and methodologies for additionality that have been borrowed from the CDM have been simplified, which did not generally strengthen their environmental integrity. Therefore, the issues raised here in the context of the CDM will remain relevant for other international offset programs.

The future role of crediting mechanisms should be revisited in the light of the Paris Agreement. The CDM in its current form will end with the conclusion of the second commitment period of the Kyoto Protocol. Several elements of the CDM could, nevertheless, be used when implementing the mechanism established under Article 6.4 of the Paris Agreement or when implementing (bilateral) crediting mechanisms under Article 6.2. However, the context for using crediting mechanisms has fundamentally changed. The most important change to the Kyoto architecture is that all countries have to submit NDCs that include mitigation pledges or actions. As of 15 December 2015, 187

⁹⁸ <http://wupperinst.org/en/projects/details/wi/p/s/pd/377/>.

countries, covering around 95% of global emissions in 2010 and 98% of global population, have submitted NDCs (CAT 2015). Many mitigation pledges in NDCs cover economy-wide emissions or large parts of the economy. This implies that much of the current CDM project portfolio will fall within the scope of NDCs.

The Paris Agreement requires countries to adjust their reported GHG emissions for international transfers of mitigation outcomes in order to avoid double counting of emission reductions. This implies that the baseline, and therefore additionality, may be determined in relation to the mitigation pledges rather than using a 'counterfactual' scenario as under the CDM, and that countries could only transfer emission reductions that were beyond that which they had pledged under their NDCs. Double counting can occur, *inter alia*, if the same emission reductions are accounted by both the host country – as reflected in its GHG inventory – and the country using these credits towards achieving its mitigation pledge. Avoiding such double counting could imply that host countries will have to add internationally transferred credits to their reported GHG emissions if the emission reductions fall within the scope of their mitigation pledges. This has several important implications.

Firstly, issuing and transferring credits that do not represent additional emission reductions or are under- or over-credited has other implications for global GHG emissions. Under the Kyoto Protocol, non-additional CDM projects or over-crediting increase global GHG emissions, whereas under-crediting from additional projects provides a net mitigation benefit. The implications are different and more complex when the emission reductions fall within the scope of the NDC of the host country: they depend on whether the credited activities are additional, whether they are over- or under-credited, the ambition of the mitigation pledge of the host country, *i.e.* whether or not it is below BAU emissions, and whether the emission reductions are reflected in the host country's GHG inventory⁹⁹ (Kollmuss et al. 2015b). Compared to the situation in which international transfers of credits would not be allowed, global GHG emissions could not be affected, decrease or increase due to the transfer of credits, depending on the circumstances. For example, if the host country has an ambitious NDC, non-additionality and over-crediting may not necessarily increase global GHG emissions because the country would have to reduce other GHG emissions to compensate for the adjustments to its reported GHG emissions. For the same reasons, under-crediting would not necessarily lead to a global net mitigation benefit. Additionality and over-crediting mainly matter when host countries have weak mitigation pledges above BAU emissions.

A second important implication relates to the incentives for host countries to ensure integrity and participate in international crediting mechanisms. If mitigation pledges are ambitious, host countries might be cautious to 'give away' non-additional credits. To achieve its mitigation pledge, the host country would need to compensate for exports of non-additional credits, by further reducing its emissions. Host countries with ambitious and economy-wide mitigation pledges would thus have incentives to ensure that international transfers of credits are limited to activities with a high likelihood of delivering additional emission reductions. However, our analysis showed that only a few project types in the current CDM project portfolio have a high likelihood of providing additional emission reductions, whereas the environmental integrity is questionable and uncertain for most project types. For those project types with a high likelihood of additionality, the potential for further emission reductions is limited and it is unclear whether host countries would be willing to engage in crediting for this 'low-hanging fruit' mitigation potential. The experience with Joint Implementation showed that most credits originated from countries with 'hot air', *i.e.* where the emission pledge is less ambitious than BAU emissions, while the potential for crediting was quite limited in countries

⁹⁹ Some emissions reductions may not be reflected in the country-wide GHG inventory, for example, because the country uses simple Tier 1 methods to estimate an emissions source which do not account for the emission reductions achieved through CDM projects or because the reductions occur in a sector that is not covered by the host country's GHG inventory.

with ambitious mitigation targets, also due to overlap with other climate policies (Kollmuss et al. 2015b). In conclusion, this suggests that the future supply of credits may mainly come either from emission sources not covered by mitigation pledges or from countries with weak mitigation pledges. In both cases, host countries would not have incentives to ensure integrity and credits lacking environmental integrity could increase global GHG emissions.

At the same time, demand for international credits is also uncertain. Only a few countries, including Japan, Norway and Switzerland, have indicated that they intend to use international credits to achieve their mitigation pledges. An important source of demand could come from the market-based approach pursued under the International Civil Aviation Organization (ICAO), and possibly from an approach pursued under the International Maritime Organization (IMO). For these demand sources, avoiding double counting with emission reductions under NDCs will be a challenge that is similar to that of avoiding double counting between countries.

A number of institutions are exploring the use of crediting mechanisms as a vehicle to disburse results-based climate finance without actually transferring any emission reduction units. This way of using crediting mechanisms could be more attractive to developing countries; they would not need to add exported credits to their reported GHG emissions, as long as the credits are not used by donors towards achieving mitigation pledges. The implications of non-additional credits are also different: they would not directly affect global GHG emissions, but could lead to a less effective use of climate finance, which could indirectly increase global GHG emissions compared to using the available resources more effectively. However, donors of climate finance aim to ensure that their funds be used for actions that would not go ahead without their support. They need to show that their investments *'make a difference'*. Given the considerable shortcomings with the approaches for assessing additionality, we recommend that donors should not rely on current CDM rules to assess the additionality of projects considered for funding.

Some countries pursue domestic crediting policies. South Korea allows companies to convert CERs from Korean projects into units eligible under its domestic emissions trading system. The Chinese and California-Quebec ETS allow the use of credits from domestic offsetting projects. Mexico, South Africa and Switzerland are pursuing policies that allow using domestic credits to meet tax or other obligations (see also the paragraph above on other offsetting programs). In these cases, using non-additional credits has no direct implication on global GHG emissions but will increase the country's costs towards achieving its NDC. In the long run, this provides incentives for these countries to limit crediting to project types with a high likelihood of additionality. However, meeting the ambitious long-term climate change mitigation goals of the UNFCCC and the Paris Agreement requires much stronger action and a rapid bridging of the emissions gap (UNEP 2015). It is hard to imagine that such ambitious goals could be achieved on a global level in a timely manner without a sharing of effort or burdens that could encompass some form of transfer of mitigation outcomes and/or results-based climate finance.

Taking into account this context and the findings of our analysis as well as other evaluations, we recommend that policy makers revisit the role of crediting in future climate policy:

- **Moving towards more effective climate policies:** We recommend focusing climate mitigation efforts on forms of carbon pricing that do not rely extensively on credits, and on measures such as results-based climate finance that do not necessarily serve to offset other emissions. If well designed, emission trading systems and carbon taxes have several advantages over crediting mechanisms: they do not require additionality to be assessed or hypothetical baselines to be set but rather rely on information on actual emissions for which information asymmetry is more manageable; in principle, they make the polluter pay rather than providing subsidies; and they expose all regulated entities to a carbon price, enabling

up-scaled, sector-wide emission reductions. We recommend that international crediting mechanisms play a limited role after 2020 to address specific emission sources in countries that do not have the capacity to implement broader climate policies. Crediting should not be further pursued as a main tool for GHG mitigation.

- **Fundamental and far-ranging changes to the CDM:** To enhance the integrity of international crediting mechanisms such as the CDM and to make them more attractive to both buyers and host countries with ambitious NDCs, we recommend limiting the mechanism to project types that have a high likelihood of delivering additional emission reductions. We recommend reviewing methodologies systematically to address risks of over-crediting, as identified in this report. We further recommend revisiting the current approaches for additionality, with a view to abandoning subjective approaches and adopting more standardized approaches where possible. We also recommend curtailing the length of the crediting periods with no renewal. A larger question is whether the UNFCCC and CDM processes can create the consensus needed to make the fundamental changes needed to improve the integrity of the CDM in significant ways.
- **Purchase of CERs:** We recommend potential buyers of CERs to limit any purchase of CERs to either existing projects that are at risk of stopping GHG abatement ('vulnerable projects') or the few project types that have a high likelihood of ensuring environmental integrity. Continued purchase of CERs should be accompanied with a plan and support to host countries to transition to broader and more effective climate policies that ensure GHG abatement in the long-run. Purchase of CERs could also be used to deliver results-based finance in this context. Further, we recommend pursuing the purchase and cancellation of CERs, as a form of results-based climate finance, rather than using CERs for compliance towards meeting mitigation targets.
- **Mechanisms under Article 6 of the Paris Agreement:** Given the high integrity risks of crediting mechanisms, we recommend that Parties consider provisions that provide strong incentives to the Parties involved to ensure integrity of international transfers of mitigation outcomes. This includes robust accounting provisions, inter alia, to avoid double counting of emission reductions, but should also extend to other elements, such as comprehensive, transparent and ambitious mitigation pledges as a prerequisite to participating in international mechanisms.

In conclusion, we believe that the CDM had a very important role to play, in particular in countries that were not yet in a position to implement domestic climate policies. However, our assessment and other evaluations confirm the strong shortcomings inherent to crediting mechanisms. With the adoption of the Paris Agreement, implementing more effective climate policies including international cooperative actions becomes key to bringing down emissions quickly to a pathway consistent with well below 2°C. Our findings suggest that crediting approaches should play a time-limited and niche-specific role, where additionality can be relatively assured, and the mechanism can serve as stepping-stone to other, more effective policies to achieve cost-effective mitigation. In doing so, continued support to developing countries will be key. We recommend using new innovative sources of finance, such as revenues from auctioning of ETS allowances, rather than international crediting mechanisms, to support developing countries in implementing their NDCs.

8. Annex

8.1. Representative samples of CDM projects

8.1.1. Task

The population consists of 7,418 CDM projects which have 4 characteristics (location, technology, size, time), from which representative samples for three additionality approaches (investment analysis, barrier analysis and common practice analysis) should be drawn. One challenge consists of the fact that the additionality approaches are not directly known before the analysis. After some preliminary analyzes, we decided on a two-step approach.

1. Draw a representative sample with regard to all strata of the 4 characteristics of size 300. The additionality approaches are determined for the projects in this sample.
2. Draw sub-samples from the projects belonging to each of the three additionality approaches, which are representative for the strata of the 4 characteristics, as they occur for the projects of each additionality approach. The sub-samples shall consist of 50 projects each, which are to be further divided into one 30-project sample and two 10-project samples. The 30- and 10-project sample should each be representative of the strata and combine to the 50-project sample.

8.1.2. Approach

The challenge consists of the fact that the small sample sizes lead to less than one draw for many strata. In a first step, therefore, a randomised procedure is necessary to identify the strata from which to draw, such that the frequencies of the strata are best preserved from the population to the samples.

Drawing the 300-project sample

1. Randomly select strata from which to draw
 - a) Calculate the target number of draws for each stratum as (stratum frequency) (population size) (sample size). These are decimal numbers and often below.

In order to obtain an integer number of draws for a stratum, discretise its corresponding target number to the enclosing integers, e.g. 2.1 is randomly assigned either 2 or 3, where the probability of the assignment of the higher enclosing integer is weighted with $(\text{target number})^{(\text{lower enclosing integer})}$. In the example, the probability that 2.1 becomes 3 is therefore weighted with $2.1^2 \approx 0.1$. The number of target numbers assigned to the higher enclosing integer is determined such that the sum of all assigned lower enclosing integer and all assigned higher enclosing integer is as close as possible to the rounded sum of all respective target numbers.

For example, assume 3 target numbers between 2 and 3, namely (2.1, 2.3, 2.9). Their rounded sum is 7. Drawing twice from two strata and three times from one strata yields the targeted 7 total draws. The third strata with the target number 2.9 has the highest chance of being chosen for the three draws.

- b) Strata with 0 frequency in the population have of course 0 frequency in the samples as well.
2. Randomly draw from the strata with the discretised target numbers of the previous steps.

Drawing sub-samples of the 300-project sample with the added additionality approach information

From the 300-project sample, we extract the projects that belong to each additionality approach, yielding three sub-samples. From each of these sub-samples, we draw samples of 50 projects, which are representative with regard to the strata of the 4 characteristics in the respective sub-sample. We employ the same approach as for drawing the 300-project sample (Section 2.1).

These three samples of 50 projects are ordered with respect to the strata of the 4 characteristics. Then we extract two sub-sets of 10 projects, one consisting of the 1st, 6th, 11th, 15th... project, the second consisting of the 3rd, 8th, 13th, 18th... project of the ordered sample. The 30-project sample consists of the remaining projects. This ensures that the strata within the 50-project sample are preserved in the smaller samples as well as possible.

8.1.3. Samples

Investment analysis: 69, 544, 1436, 1906, 2007, 2075, 2229, 2525, 3068, 3490, 3703, 4042, 4317, 4657, 5047, 5659, 5661, 5707, 5757, 6052, 6899, 7073, 7185, 7843, 7974, 8057, 8523, 8615, 8801, 9002

1875, 2315, 3033, 3186, 3799, 4600, 4687, 5843, 7024, 7551, 8903

1795, 2931, 4817, 5555, 6173, 6440, 7540, 8291, 8818, 8821

Barrier analysis: 244, 348, 582, 644, 1053, 1408, 1578, 1738, 2180, 2561, 3174, 3191, 3639, 3739, 3856, 4468, 4478, 4508, 4748, 5099, 5749, 5961, 6012, 6302, 6636, 7242, 7392, 7651, 8680, 9419

534, 831, 937, 1151, 1827, 2098, 4147, 5234, 7595, 8319

544, 2077, 2975, 3393, 4089, 5888, 6246, 7578, 8927, 9100

Common practice analysis: 69, 1227, 1602, 1737, 2007, 2075, 2098, 2109, 2302, 2315, 3068, 3186, 3642, 3670, 3799, 4687, 5006, 5359, 5659, 5843, 6173, 6553, 6899, 7648, 7936, 8125, 8140, 8506, 8636, 9699

588, 2486, 3994, 4317, 6440, 7400, 8093, 8505, 8523, 8879

366, 544, 1661, 1875, 3703, 4042, 4310, 5487, 7494, 8818

8.2. Information on suppressed demand in CDM methodologies

Table 8-1: Information on suppressed demand in CDM methodologies

Meth No.	Definition of baseline technology	Definition of MSL	Definition of baseline activity level
ACM0014	Methane Correction Factor of 0.4 for domestic wastewater	None	Project activity level (i.e. quantity of wastewater treated)
AMS I.A	Allows AMS I.L approach	Allows AMS I.L approach	Project activity level (i.e. quantity of electricity consumed)
AMS III.AR	Fossil fuel powered lamp	3.5 hrs per day x 2 CFL lamps (240 lux)	Deemed savings with fossil fuel lamp to match MSL, with annual growth in kerosene consumption
AMS II.G	Mix of fossil fuel cooking technologies	None	Project activity level (i.e. quantity of biomass saved)
AMS III.F	Unmanaged waste disposal with > 5m depth (methane Correction Factor of 0.8)	MSL is having a waste disposal site	Project activity level (i.e. quantity of waste converted to compost)
AMS I.E	Mix of fossil fuel cooking technologies	None	Project activity level (i.e. quantity of renewable energy used)
ACM0022	Unmanaged waste disposal with < 5m depth (methane correction factor of 0.4)	MSL is having a waste disposal site	Project activity level, although project proponent may propose another baseline
AMS I.L	Kerosene pressure lamp for lighting; car battery for appliances; diesel generator for larger loads	240 lux for lighting (50 kWh/yr using CFL), 195 kWh/yr for other appliances	Project activity level (i.e. quantity of electricity consumed) but with emissions factor of baseline technology
AMS III.BB	Kerosene pressure lamp for lighting; car battery for appliances; diesel generator for larger loads	240 lux for lighting (50 kWh/yr using CFL), 195 kWh/yr for other appliances	Project activity level (i.e. quantity of electricity consumed) but with emissions factor of baseline technology
AMS III.AV	Fossil fuel or non-renewable biomass to boil water (only requires justification if share of total population without access to improved drinking water is > 60%)	No minimum, but sets maximum level of 5.5 litres per person-day for crediting	Project activity level (i.e. quantity of water purified by project), but capped at 5.5 litres per person per day

Sources: Authors' own compilation

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Carbon Credits Likely Worthless in Reducing Emissions, Study Says



Schemes allowed by the Paris climate agreement won't help countries reach their reduction targets, European report says, and should be phased out.



BY NICHOLAS KUSNETZ

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Trading emissions credits from clean energy projects don't help reduce emissions, a new study says. Credit: Getty Images

As nations grapple with how they can slash their emissions as part of the **Paris climate agreement**, some may use international credit schemes that were approved in the treaty process. A new **report from the European Commission** casts serious doubts about such credits, however, concluding that the vast majority of them likely fail to actually reduce emissions.

The report, which was written last year but not published until this April, concludes that buying and selling emissions credits for overseas projects should be limited to a select list that meet rigorous standards, and used only as part of a transition to more effective policies for mitigating greenhouse gas emissions.

"Given the inherent shortcomings of crediting mechanisms, we recommend focusing climate mitigation efforts on forms of carbon pricing that do not rely extensively on credits," the report said, adding that credits should play only a limited role after 2020.

"It's a confirmation that offsetting is fundamentally problematic," said Aki Kachi, international policy director for **Carbon Market Watch**, an advocacy group in Brussels.

The study examined the **Clean Development Mechanism**, created under the Kyoto Protocol to allow countries to offset emissions by purchasing credits linked to green-energy projects on an international market. The system allows a power plant in Germany, for example, to buy credits for the emissions savings

from a wind farm in India.

The problem, the report says, is that the Indian wind farm likely would have been built anyway, even without the credits purchased by the Germans. In emissions-trading lingo, the reduction would be considered not "additional."

"Overall, our results suggest that 85 percent of the projects covered in this analysis and 73 percent of the potential 2013-2020 Certified Emissions Reduction (CER) supply have a low likelihood that emission reductions are additional and are not over-estimated," said the report, which was prepared by the Öko-Institut e.V., a German research group. "Only 2 percent of the projects and 7 percent of potential CER supply have a high likelihood of ensuring that emission reductions are additional and are not over-estimated."

In short, the vast majority of credits are unlikely to actually reduce emissions. And while the report examined the Clean Development Mechanism specifically, it said that many of the problems are inherent to emissions crediting schemes, and that the lessons learned would likely apply elsewhere.

Carbon offset credits were included as part of the Kyoto Protocol, but have fallen out of favor after scandals in Europe and poor performance, Kachi said. Some countries now decline to use them and the [European Union plans to prohibit international trading](#) after 2020.

The Paris Agreement left the door open on emissions trading, but it left the details undefined, Kachi said.

"Two years later we're supposed to have more detailed rules for how these things will work under the Paris Agreement, but there's been no progress," he said. "It's a controversial issue that the world definitely has found no consensus over."

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ABOUT THE AUTHOR



Nicholas Kusnetz

Nicholas Kusnetz is a reporter for InsideClimate News. Before joining ICN, he ran the Center for Public Integrity's State Integrity Investigation, which won a New York Press Club Award for Political Coverage. He also covered fracking as a reporting fellow at ProPublica and was a 2011 Middlebury Fellow in Environmental Journalism. His work has appeared in more than a dozen

publications, including Slate, The Washington Post, Businessweek, Mother Jones, The Nation, Fast Company and The New York Times.

Nicholas can be reached at: nicholas.kusnetz@insideclimatenews.org. PGP key: <http://bit.ly/2k5fncn>



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BY NICHOLAS KUSNETZ

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California's 2017 Climate Change Scoping Plan

The strategy for achieving California's
2030 greenhouse gas target

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Decades of Leadership

From the first law to protect rivers from the impact of gold mining in 1884, to decades of work to fight smog, the Golden State has set the national – and international – standard for environmental protection. California pushes old boundaries, encounters new ones, and figures out ways to break through those as well. This is part of the reason why California has grown to become both the 6th largest economy in the world, and home to some of the world's strongest environmental protections. And, we have seen our programs and policies adopted by others as they seek to protect public health and the environment.

California's approach to climate change channels and continues this spirit of innovation, inclusion, and success. The 2030 target of 40 percent emissions reductions below 1990 levels guides this Scoping Plan, as the economy evolves to reduce greenhouse gas (GHG) emissions in every sector. It also demonstrates that we are doing our part in the global effort under the Paris Agreement to reduce GHGs and limit global temperature rise below 2 degrees Celsius in this century.

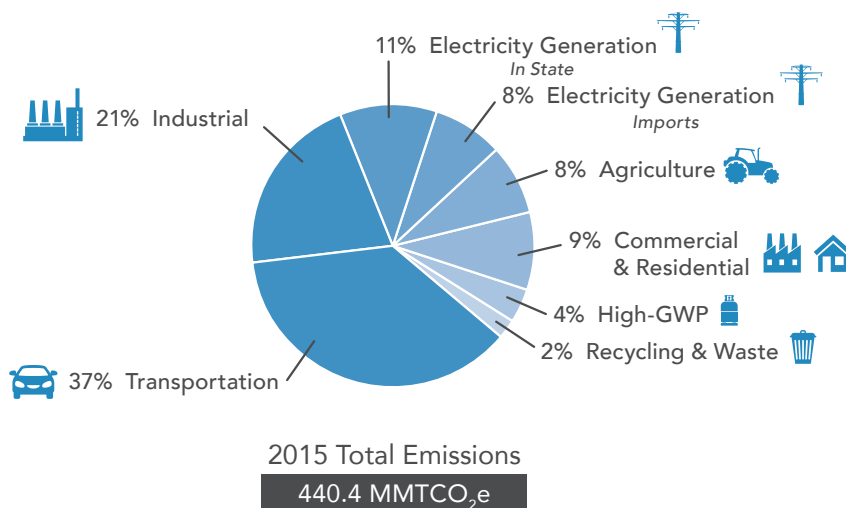
California's 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target (Plan) builds on the state's successes to date, proposing to strengthen major programs that have been a hallmark of success, while further integrating efforts to reduce both GHGs and air pollution. California's climate efforts will:

- Lower GHG emissions on a trajectory to avoid the worst impacts of climate change;
- Support a clean energy economy which provides more opportunities for all Californians;
- Provide a more equitable future with good jobs and less pollution for all communities;
- Improve the health of all Californians by reducing air and water pollution and making it easier to bike and walk; and
- Make California an even better place to live, work, and play by improving our natural and working lands.



Governor Brown signs SB 32 recommitting California's efforts to curb climate change.

CALIFORNIA CARBON EMISSIONS BY SCOPING PLAN SECTOR



The Climate Imperative – We Must Act

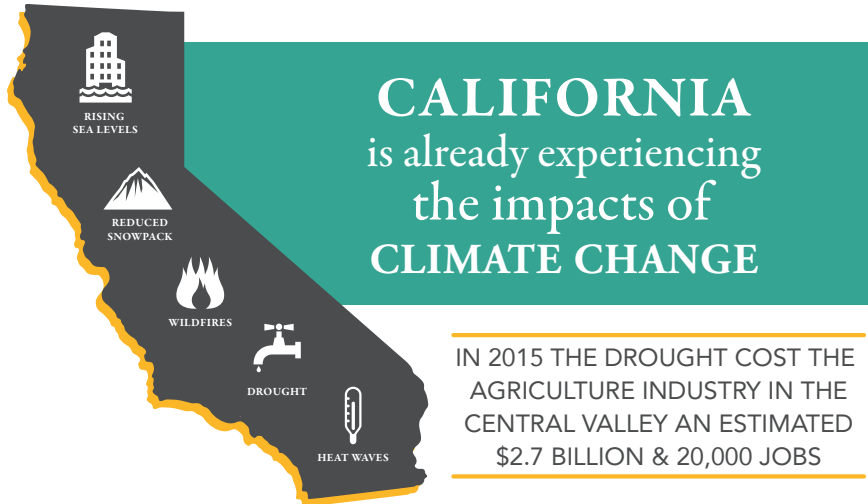
The evidence that the climate is changing is undeniable. As evidence mounts, the scientific record only becomes more definitive – and makes clear the need to take additional action now.

In California, as in the rest of the world, climate change is contributing to an escalation of serious problems, including raging wildfires, coastal erosion, disruption of water supply,

threats to agriculture, spread of insect-borne diseases, and continuing health threats from air pollution.

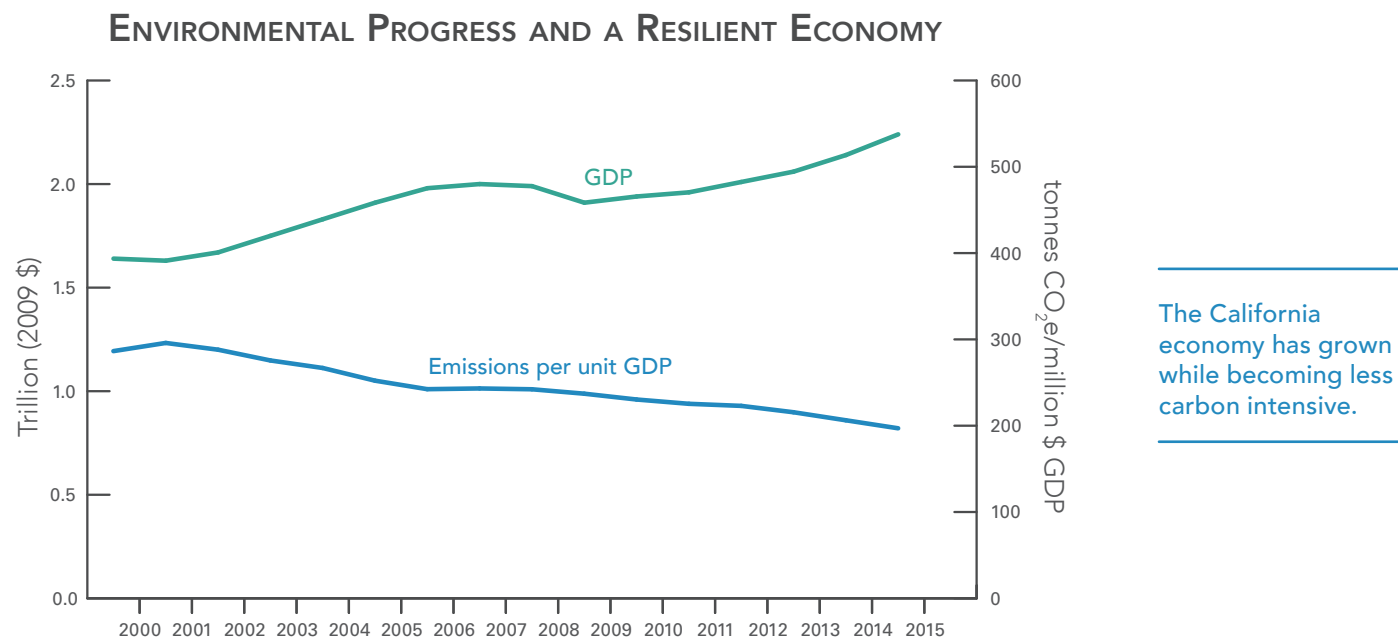
The drought that plagued California for years devastated the state's agricultural and rural communities, leaving some of them with no drinking water at all. In 2015 alone, the drought cost agriculture in the Central Valley an estimated \$2.7 billion, and more than 20,000 jobs. Last winter, the drought was broken by record-breaking rains, which led to flooding that tore through freeways, threatened rural communities, and isolated coastal areas. This year, California experienced the deadliest

wildfires in its history. Climate change is making events like these more frequent, more catastrophic and more costly. Climate change impacts all Californians, and the impacts are often disproportionately borne by the state's most vulnerable and disadvantaged populations.



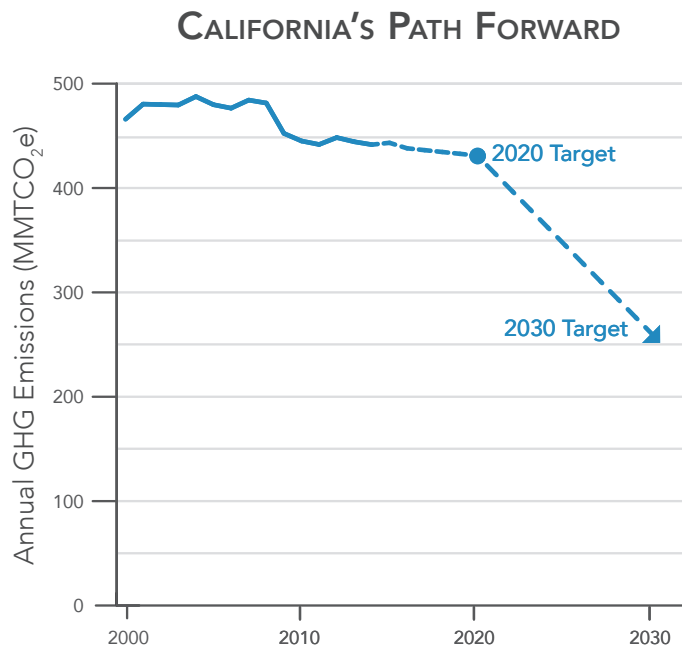
California is on Track – But There is More to Do

Although the California Global Warming Solutions Act of 2006 – also known as AB 32 – marked the beginning of an integrated climate change program, California has had programs to reduce GHG emissions for decades. The state’s energy efficiency requirements, Renewable Portfolio Standard, and clean car standards have reduced air pollution and saved consumers money, while also lowering GHG emissions.



AB 32 set California’s first GHG target called on the state to reduce emissions to 1990 levels by 2020. California is on track to exceed its 2020 climate target, while the economy continues to grow. Since the launch of many of the state’s major climate programs, including Cap-and-Trade, economic growth in California has consistently outpaced economic growth in the rest of the country. The state’s average annual growth rate has been double the national average – and ranks second in the country since Cap-and-Trade took effect in 2012. In short, California has succeeded in reducing GHG emissions while also developing a cleaner, resilient economy that uses less energy and generates less pollution.

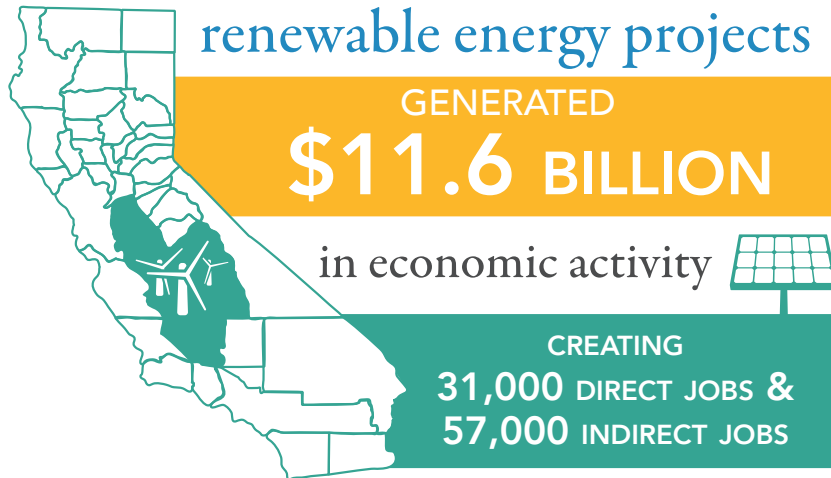
Importantly, the State’s 2020 and 2030 targets have not been set in isolation. They represent benchmarks, consistent with prevailing climate science, charting an appropriate trajectory forward that is in line with California’s role in stabilizing global warming below dangerous thresholds. As we consider efforts to reduce emissions to meet the State’s near-term requirements, we must do so with an eye toward reductions needed beyond 2030. The Paris Agreement – which calls for limiting global warming to well below 2 degrees Celsius and pursuing efforts to limit it to 1.5 degrees Celsius – frames our path forward.



California's Path to 2030

Executive Order B-30-15 and SB 32 extended the goals of AB 32 and set a 2030 goal of reducing emissions 40 percent from 2020 levels. This action keeps California on target to

FROM 2002-2015 SAN JOAQUIN VALLEY



achieve the level of reductions scientists say is necessary to meet the Paris Agreement goals. This is an ambitious goal – calling on the State to double the rate of emissions reductions. Nevertheless, it is an achievable goal.

This Plan establishes a path that will get California to its 2030 target. Given our ambitious goals, this Plan is built on unprecedented outreach and coordination. Over 20 state agencies collaborated to produce the Plan, informed by 15 state agency-sponsored workshops and more than 500 public comments. The broad range of state agencies involved reflects the complex nature of addressing climate change, and the need to work across institutional

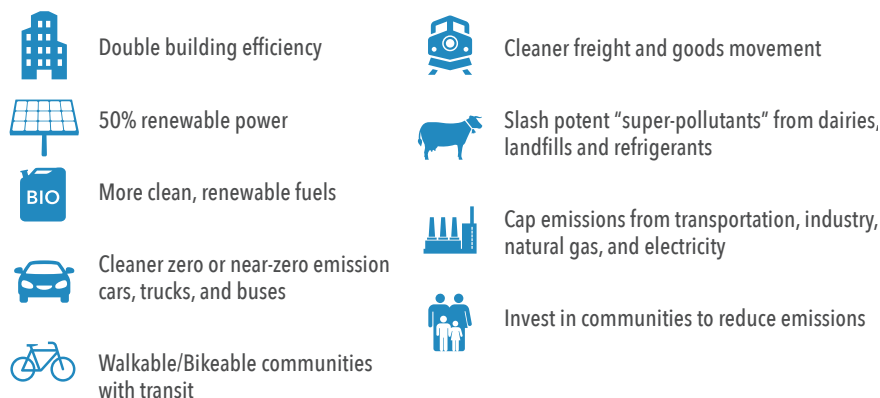
boundaries and traditional economic sectors to effectively reduce GHG emissions. As part of the Plan development, alternative strategies were considered and evaluated, ranging from carbon taxes to individual facility caps to relying solely on sector-specific regulations. In addition, efforts were made to ensure that the Plan would benefit all Californians. To this end, the Environmental Justice Advisory Committee (EJAC), a Legislatively created advisory body, convened almost 20 community meetings throughout California to discuss the climate strategy, and held 19 meetings of its own to provide recommendations on the Plan.

This Plan draws from the experiences in developing and implementing previous plans to present a path to reaching California's 2030 GHG reduction target. The Plan is a

package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state. Every sector, every local government, every region, every resident is part of the solution. The Plan underscores that there is no single solution but rather a balanced mix of strategies to achieve the GHG target. This Plan highlights the fact that a balanced mix of strategies provides California with the greatest level of certainty in meeting the target at a low cost while also improving public health, investing

in disadvantaged and low-income communities, protecting consumers, and supporting economic growth, jobs and energy diversity. Successful implementation of this Plan relies, in part, on long-term funding plans to inform future appropriations necessary to achieve California's long-term targets.

CALIFORNIA'S CLIMATE POLICY PORTFOLIO



California's Climate Vision

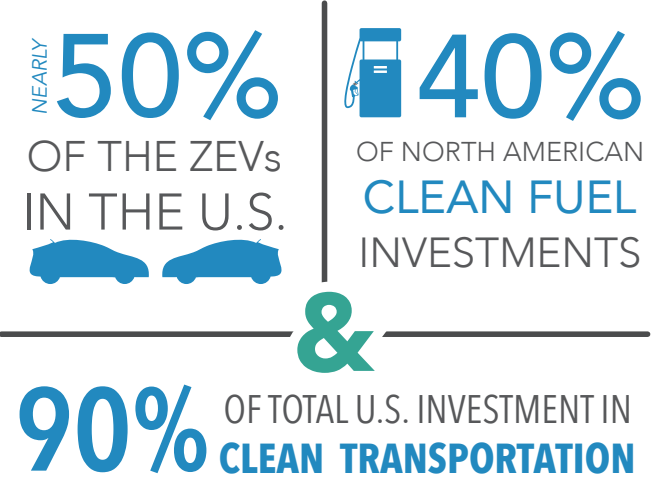
Create Inclusive Policies and Broad Support for Clean Technologies

Remarkable progress over the past 10 years has put the global energy and transportation sector on a transformative path to cleaner energy. Far outpacing previous predictions, today solar and wind power are often less expensive than coal or natural gas, and they now comprise the majority of global investment in the power sector. Electric vehicle battery costs have tumbled even more quickly than solar costs, while performance has improved dramatically, and the auto industry is committed to an electric future.

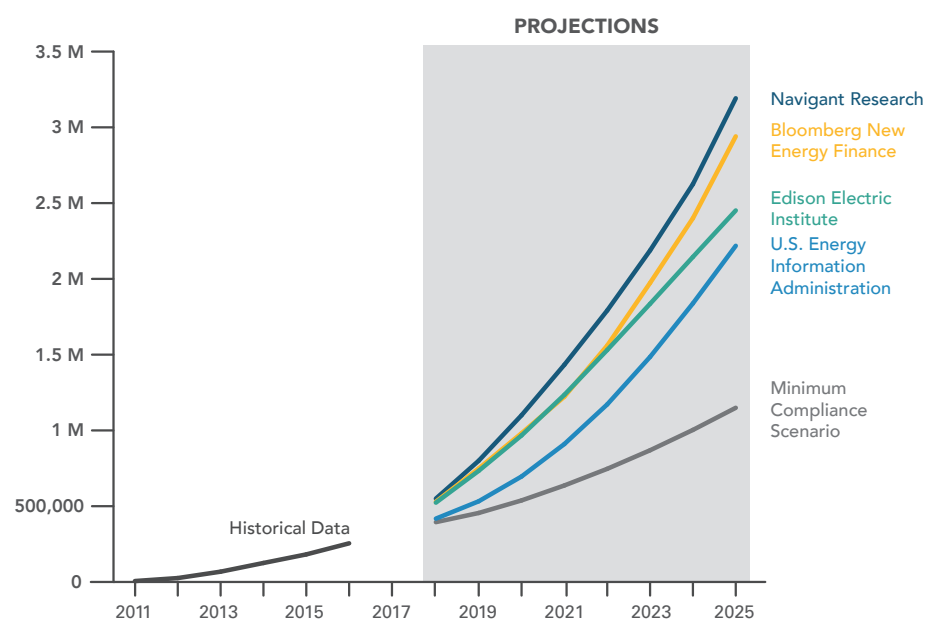
California's policies have created markets for energy efficiency, energy storage, low carbon fuels, renewable power – including utility-scale and residential-scale solar – and zero-emission vehicles. Our companies are thriving, making those markets grow. California is home to nearly half of the zero-emission vehicles in the U.S., 40 percent of North American clean fuels investments, the world's best known electric car manufacturer, and the world's leading ride-sharing services. California is further advancing efficient land use policies that reduce auto dependency. Altogether, we're unleashing nonlinear transitions to clean energy and clean transportation technologies that will put California on the path to meeting our 2030 target and the goals of the Paris Agreement.

California policymaking has succeeded through thoughtful planning, bolstered by an open public process that solicits the best ideas from a wide array of sources, and by integrating effective regulation with targeted investments to provide broad market support for clean technologies. A key element of California's approach continues to be careful monitoring and reporting on the results of our programs and a willingness to make mid-course adjustments. As the State looks to 2030 and beyond, all sectors of the economy must benefit from these ideas to create a new and better future.

California is home to



CUMULATIVE CALIFORNIA ZEV SALES PROJECTIONS



Experience has shown clean technology and markets continue to outpace expectations.

LEGISLATIVE LEADERSHIP ON CLIMATE

The California Legislature has shaped the State's climate change program, setting out clear policy objectives over the next decade:

- 40% reduction in GHG emissions by 2030;
- 50% renewable electricity;
- Double energy efficiency savings;
- Support for clean cars;
- Integrate land use, transit, and affordable housing to curb auto trips;
- Prioritize direct reductions;
- Identify air pollution, health, and social benefits of climate policies;
- Slash "super pollutants";
- Protect and manage natural and working lands;
- Invest in disadvantaged communities; and
- Strong support for Cap-and-Trade.

The benefits of innovative technologies need to reach all residents and businesses. Air pollution reductions and the associated health benefits should be targeted to communities where they are needed most. All Californians need access to clean transportation options that enable healthy communities to develop and thrive, including walking, cycling, transit, rail, and clean vehicle options.

Although GHG reductions can help to reduce harmful air pollution, California must concurrently employ other strategies to accelerate reductions of pollutants from large industrial sources that adversely impact communities. Newly passed AB 617 strengthens existing criteria and toxic air pollutant programs and our partnerships with local air districts to further reduce harmful air pollutants and protect communities. More fundamentally, AB 617 establishes a comprehensive statewide program – the first of its kind – to address air pollution where it matters most: in neighborhoods with the most heavily polluted air.

CALIFORNIA'S GOALS



California's environmental justice and equity movement is establishing a blueprint for the nation and world. The State is pioneering targeted environmental and economic development programs to help those most in need. So far, half of all California Climate Investments, stemming from the State's Cap-and-Trade-Program, have been used to provide benefits in the 25 percent of California communities that are most disadvantaged by environmental and socio-economic burdens. By increasingly engaging with, and investing in, these communities – investing in technical assistance resources, holding listening sessions, improving our programs, and accelerating our efforts to bring the cleanest technologies to mass market – all California residents can have clean air to breathe, clean water to drink, and opportunities to participate in the cleaner economy.

ACHIEVING SUCCESS IN EQUITY AND ACCESS

- Continue to engage local organizations and invest in disadvantaged communities to ensure broad access to clean technologies;
- Ensure air pollution reductions happen where they are needed the most;
- Integrate across programs and agencies to ensure complementary policies provide maximum benefits to disadvantaged communities;
- Implement California Energy Commission and CARB recommendations to overcome barriers to clean energy and clean transportation options for low-income residents;
- Provide energy-efficient affordable housing near job centers and transit; and
- Implement AB 617 to dramatically improve air quality in local communities through targeted action plans.



Enhance Industrial Efficiency & Competitiveness

California leads the country in manufacturing and industrial efficiency. For every dollar spent on electricity, our manufacturers produce 55 percent more value than the national average. And the efficiency of California industry continues to grow at rates faster than the national average. High efficiency rates, coupled with the Cap-and-Trade Program's firm emission cap, allow economic activity to increase without corresponding increases in GHG emissions. In other words, the more California produces, the better it is for the planet. Maintaining and extending our successful programs – from the Cap-and-Trade Program and Low Carbon Fuel Standard to zero-emission, renewable energy and energy efficiency programs – will reduce GHGs, increase energy cost savings, offer businesses flexibility to reduce emissions at low cost and provide clear policy and market direction, and certainty, for business planning and investment. This will encourage continued research, evaluation, and deployment of innovative strategies and technology to further reduce emissions in the industrial sector through advances in energy efficiency and productivity, increased access to cleaner fuels, and carbon capture, utilization and storage.

ACTION ON HFCs

Hydrofluorocarbons (HFCs) represent one of the biggest opportunities to reduce GHGs in the State through 2030 due to their high climate impacts, and in many cases, offer energy efficiency and financial savings, as well. The world recently agreed to phase down their use, but California has committed to move more quickly, in line with the scope of the opportunity for cost-effective emissions reductions in the State.

ACHIEVING SUCCESS IN INDUSTRIAL EFFICIENCY AND COMPETITIVENESS

- Evaluate and implement policies and measures to continue reducing GHG, criteria, and toxic air contaminant emissions from sources such as refineries;
- Improve productivity and strengthen economic competitiveness by further improving energy efficiency and diversifying fuel supplies with low carbon alternatives;
- Prioritize procurement of goods that have lower carbon footprints
- Support and attract industry that produces goods needed to reduce GHGs; and
- Cut energy costs and GHG emissions by quickly transitioning to efficient HFC alternatives.

Prioritize Transportation Sustainability

California's transportation system underpins our economy. The extensive freight system moves trillions of dollars of goods each year and supports nearly one-third of the state economy and more than 5 million jobs. The way we plan our communities impacts everything from household budgets to infrastructure needs, productivity lost to congestion, protection of natural and working landscapes, and our overall health and well-being. And transportation is the largest source of GHG, criteria, and toxic diesel particulate matter emissions in the state.

RENEWABLE DIESEL USE

has increased 7000% since 2011

California's ability to remain an economic powerhouse and environmental leader requires additional efforts to improve transportation sustainability with a comprehensive approach that includes regulation, incentives, and investment.

This approach addresses a full range of

transportation system improvements relating to efficient land use, affordable housing, infrastructure for cyclists and pedestrians, public transit, new vehicle technologies, fuels and freight. One example is the deployment of the nation's first high-speed rail system, which will include seamless connections to local transit.

The approach is working: California is home to nearly half of the country's zero-emission vehicles. Innovative alternative fuel producers and oil companies are bringing more low carbon fuels to market than required by the Low Carbon Fuel Standard. And, the State has committed to investing billions in zero-emission vehicles and infrastructure, land use planning, and active transportation options such as walking and biking. In fact, renewable fuels in the heavy-duty vehicle sector are displacing diesel fossil fuel as quickly as renewable power is replacing fossil fuels on the electricity grid. California's climate policies will also reduce fossil fuel use and decouple the state from volatile global oil prices. CARB's analyses show fossil fuel demand will decrease by more than 45 percent by 2030, which means Californians will be using less gasoline and diesel resulting in healthier air and cost-savings on transportation fuels. These benefits will be further amplified as we move away from light-duty combustion vehicles.

By re-doubling our efforts, California can make sure that markets tip quickly and definitively in the favor of electric cars, trucks, buses, and equipment, while increasing the use of clean, low carbon fuels where zero-emissions options are not yet available. Local transportation planning can make communities become healthier and more vibrant and connected – encouraging housing, walking, biking and transit policies that reduce GHGs and promote good quality of life. And, we can work to ensure that an efficient sustainable freight system continues to power our ever-growing economy.





ACHIEVING SUCCESS IN TRANSPORTATION SUSTAINABILITY

- Connect California's communities with a state-of-the-art high-speed rail system;
- Promote vibrant communities and landscapes through better planning efforts to curb vehicle-miles-traveled and increase walking, biking and transit;
- Build on the State's successful regulatory and incentive-based policies to quickly make clean cars, trucks, buses, and fuels definitive market winners;
- Coordinate agency activities to ensure that emerging automated and connected vehicle technologies reduce emissions; and
- Improve freight and goods movement efficiency and sustainability to enable California's continued economic growth.

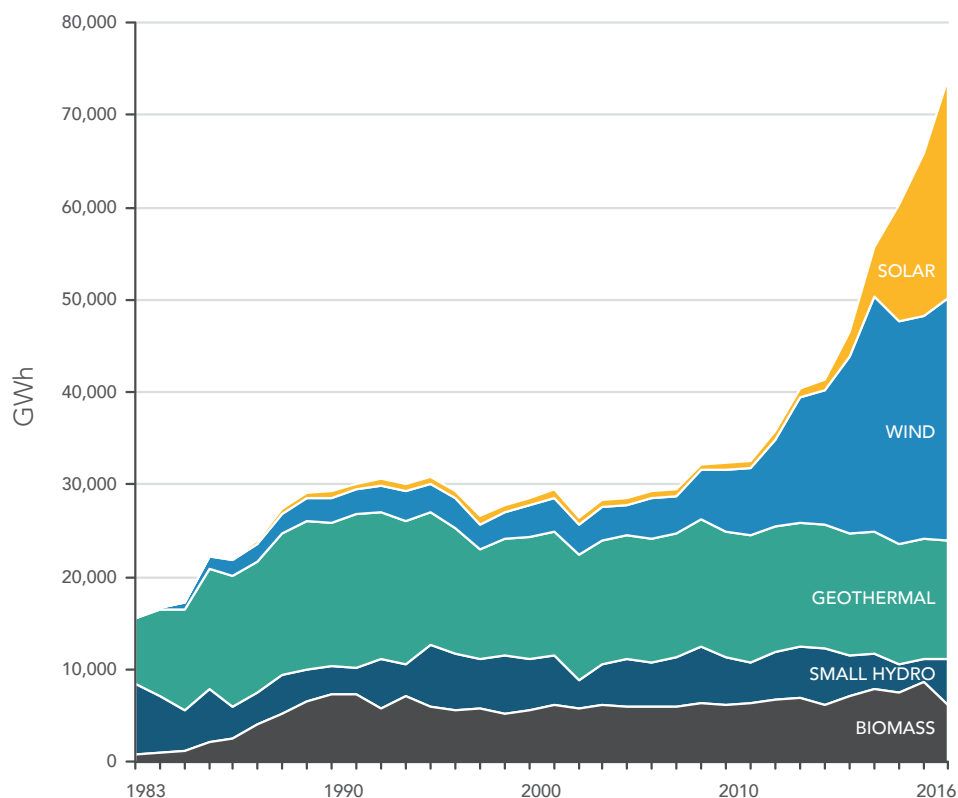


Continue Leading on Clean Energy

California is well ahead of schedule in meeting its renewable energy targets. Wind and solar generation have grown exponentially in recent years, while hydroelectric, geothermal, and biomass have consistently contributed renewable power to our energy supply. Californians are the ones who will take action to meet energy efficiency targets, integrate renewable power through demand response, and drive demand for net zero energy buildings. This includes self-generation which also grew exponentially in recent years with installed solar totaling 2,000 megawatts (MW) in 2014 and 5,100 MW of the total statewide self-generation installed solar in 2015. By June 2017, solar installed in California was about 5,800 MW, far exceeding the State's goals.

INCREASING RENEWABLE ELECTRICITY GENERATION (IN & OUT OF STATE)

The Renewable Portfolio Standard, Carbon Pricing, and lower costs for renewable technology are delivering real environmental benefits.





While at this time natural gas is an important energy source, we must move toward cleaner heating fuels and replicate the progress underway for electricity. As with electricity, this starts with efficiency and demand reduction, including building and appliance electrification where these advancements make sense. It calls for minimizing fugitive methane leaks throughout the system, including beyond California's borders where 90 percent of the natural gas used here originates. And, it includes using more renewable gas – a valuable in-state resource made from waste products – especially in the transportation sector. Replacing fossil fuels with renewable gas can reduce potent short-

Reaching California's Clean Electricity Goals



The State's 3 largest investor-owned utilities are on track to achieve a 50% RPS by 2020.

lived climate pollutants, and state policies should support this effort. Reducing demand for natural gas, and moving toward renewable natural gas, will help California achieve its 2030 climate target. However, switching from natural gas to electricity – where feasible and demonstrated to reduce GHGs – is needed to stay on track to achieve our long-term goals.

ACHIEVING SUCCESS IN CLEAN ENERGY

- Effectively integrate at least 50 percent renewables as the primary source of power in the State through coordinated planning, additional deployments of energy storage, and grid regionalization;
- Utilize distributed resources and engage customers by making net zero energy buildings standard, implement Existing Buildings Energy Efficiency Action Plan to double existing building efficiency, and increase access to energy efficiency, renewable energy, and energy use data; and
- Reduce the use of heating fuels while concurrently making what is used cleaner by minimizing fugitive methane leaks, prioritizing natural gas efficiency and demand reduction, and enabling cost-effective access to renewable gas.



Put Waste Resources to Beneficial Use

Effectively managing waste streams is perhaps the most basic of environmental tenets. “Reduce, re-use, and recycle” is a mantra known even to elementary school students. For decades California law has reduced waste reaching landfills and recaptured value from waste streams through recycling and composting. California law requires reducing, recycling, or composting 75 percent of solid waste generated by 2020. The State also has specific goals for diverting organic waste, which decomposes in landfills to produce the super pollutant methane. State law also directs edible food to hungry families rather than having it discarded.

Capturing value from waste makes sense. As described in the Healthy Soils Initiative, compost from organic matter provides soil amendments to revitalize farmland, reduces irrigation and landscaping water demand, and potentially increases long-term carbon storage in rangelands. Organic matter can also provide a clean, renewable energy source in the form of bioenergy, biofuels, or renewable natural gas.

California should take ownership of its waste and adhere to a waste “loading order” that prioritizes waste reduction, re-use, and material recovery over landfilling. The State can take steps to reduce waste from packaging, which constitutes about one-quarter of California’s waste stream. It can invest in and streamline in-state infrastructure development to support recycling, remanufacturing, composting, anaerobic digestion, and other beneficial uses of organic waste. And, it can help communities in their efforts to recover food for those in need.

ACHIEVING SUCCESS IN PUTTING WASTE RESOURCES TO BENEFICIAL USE

- Develop and implement programs, including edible food waste recovery, to divert organics from landfills and reduce methane emissions;
- Develop and implement a packaging reduction program; and
- Identify a sustainable funding mechanism to support waste management programs, including infrastructure development to support organics diversion.

Support Resilient Agricultural and Rural Economies and Natural and Working Lands

California's natural and working landscapes, like forests and farms, are home to the most diverse sources of food, fiber, and renewable energy in the country. They underpin the state's water supply and support clean air, wildlife habitat, and local and regional economies. They are also the frontiers of climate change. They are often the first to experience the impacts of climate change, and they hold the ultimate solution to addressing climate change and its impacts. In order to stabilize the climate, natural and working lands must play a key role.

Work to better quantify the carbon stored in natural and working lands is continuing, but given the long timelines to change landscapes, action must begin now to restore and conserve these lands. We should aim to manage our natural and working lands in California to reduce GHG emissions from business-as-usual by at least 15-20 million metric tons in 2030, to complement the measures described in this Plan.

Natural and working lands can be better incorporated into California's climate change mitigation efforts by encouraging collaboration with local and regional organizations and increasing investment to protect, enhance, and innovate in our rural landscapes and communities. The State is partnering with tribes to preserve carbon, protect tribal forest lands and increase their land base. Transportation and land use planning should minimize the footprint of the built environment, while supporting and investing in efforts to restore, conserve and strengthen natural and working lands. California's forests should be healthy carbon sinks that minimize black carbon emissions where appropriate, supply new markets for woody waste and non-merchantable timber, and provide multiple ecosystem benefits. Rehabilitating and strengthening wetlands and tidal environments, and incorporating natural landscapes into urban environments will also help make natural and working lands part of the state's climate solution. Finally, California farmers can be a powerful force in the fight against climate change, in how they manage their lands, tend their crops, and husband their livestock.



Improved forest management on tribal lands has preserved almost 3 million metric tons of carbon in California and the revenues from the carbon offsets have been used to secure ownership of ancestral lands.

ACHIEVING SUCCESS IN SUPPORTING RESILIENT AGRICULTURAL AND RURAL ECONOMIES AND NATURAL AND WORKING LANDS

- Protect, enhance and innovate on California's natural and working lands to ensure natural and working lands become a net carbon sink over the long-term;
- Develop and implement the Natural and Working Lands Implementation Plan to maintain these lands as a net carbon sink and avoid at least 15-20 metric tons of GHG emissions by 2030;
- Measure and monitor progress by completing CARB's Natural and Working Lands Inventory and implementing tracking and performance monitoring systems; and
- Unleash opportunity in the agricultural sector by improving manure management, boosting soil health, generating renewable power, electrifying operations, utilizing waste biomass, and increasing water, fertilizer, and energy use efficiency to reduce super pollutants.



Secure California's Water Supplies

Water is California's lifeblood. It sustains communities and drives the economy. An elaborate network of storage and delivery systems has enabled the state to prosper and grow. But this aging system was built for a previous time and is increasingly challenged by the realities of climate change and population growth.

THE WATER-ENERGY NEXUS

- About 12% of the total energy used in the state is related to water, with 2% for conveyance, treatment and distribution, and 10% for end-customer uses like heating and cooling.
- The water-energy nexus provides opportunities for conservation of these natural resources as well as reduction of GHGs.

Producing, moving, heating and treating water demands significant energy and produces commensurately significant emissions. As California looks to the future, meeting new demands and sustaining prosperity requires increased water conservation and efficiency, improved coordination and management of various water supplies, greater understanding of the water-energy nexus, and deployment of new technologies in drinking water treatment, groundwater remediation and recharge, and potentially brackish and seawater desalination. State efforts must support systemic shifts toward conservation, efficiency, and renewable energy in the water sector.




ACHIEVING SUCCESS IN SECURING CALIFORNIA'S WATER SUPPLIES

- Increase water savings by certifying innovative technologies for water conservation and developing and implementing new conservation targets, updated agricultural water management plans, and long term conservation regulations;
- Develop a voluntary registry for GHG emissions from energy use associated with water; and
- Continue to increase the use of renewable energy to operate the State Water Project.

Cleaning the Air and Public Health

The benefits of this Plan are broader than just climate change – implementation of the Plan will also help improve public health. The Plan incorporates freight and mobile source strategies which will deliver reductions in criteria and toxic air pollutants to improve air quality.

Climate Plan Provides Health Benefits in 2030

AVOIDED PREMATURE DEATHS	VALUE OF AVOIDED HEALTH IMPACTS	VALUE OF AVOIDED DAMAGES USING SOCIAL COST OF CARBON
		
~ 3,300	\$1.2-1.8 billion	\$1.9-11.2 billion

California continues to seek ways to improve implementation of its climate program and its ability to address the unique set of impacts facing the state’s most pollution burdened communities. In addition, CARB’s environmental justice efforts are intended to reach far beyond climate change. While this Plan provides a path for reducing GHG emissions in disadvantaged communities, it also includes new tools that will complement the Plan and lead to further air quality improvements.

In particular, implementation of AB 617 will improve air quality in local communities, in partnership with local air districts, using targeted investments in neighborhood-level air monitoring and the development of air pollution reduction action plans with strong enforcement programs. These plans will require pollution reductions from both mobile and stationary sources. Through these efforts, CARB anticipates, and will work for, increased data transparency and the adoption of new statewide air pollutant emission controls that will not only confer short-term benefits to those most in need of improvement, but which will ultimately benefit all Californians.

Under the leadership of CARB’s first executive-level environmental justice liaison, the agency is also laying a roadmap to better serve California’s environmental justice communities in the design and implementation across its broader programs.



Successful Example of Carbon Pricing and Investment

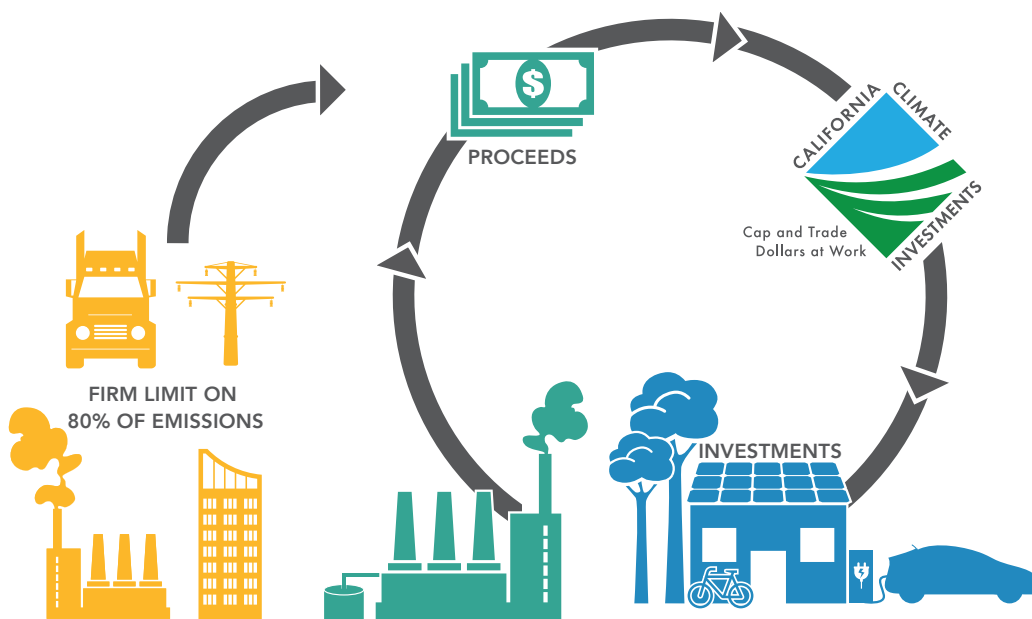
The Cap-and-Trade Program is fundamental to meeting California's long-range climate targets at low cost. The Cap-and-Trade Program includes GHG emissions from transportation, electricity, industrial, agricultural, waste, residential and commercial sources, and caps them while complementing the other measures needed to meet the 2030 GHG target. Altogether, the emissions covered by the Cap-and-Trade program total 80 percent of all GHG emissions in California. California's response to climate change has led to many innovative programs designed to reduce GHG emissions, including the Renewable Portfolio and Low Carbon Transportation Standards, but the Cap-and-Trade Program guarantees GHG emissions reductions through a strict overall emissions limit that decreases each year, while trading provides businesses with flexibility in their approach to reducing emissions. The Cap-and-Trade Program also generates revenue when the allowances to emit pollution are auctioned. Some of the revenue is returned directly to electricity ratepayers, and the rest is dedicated to reducing GHG emissions by making Legislatively directed investments in California with an emphasis on programs or projects that benefit disadvantaged and low-income communities.

CAP-AND-TRADE PROGRAM

- Firm, declining cap provides highest certainty to achieve 2030 target.
- Low cost GHG emission reductions minimize impact on consumers and economy.
- Flexibility for businesses
- Can be linked with similar programs worldwide.

Including the latest budget, approximately \$5 billion has been appropriated to reduce GHG emissions, reduce air pollutant emissions where reductions are needed most, grow markets for clean technologies, and spur emissions reductions in sectors not covered by Cap-and-Trade. These investments are strengthening the economy and improving public health – especially in the areas of the state most burdened by pollution. So far, half of the \$1.2 billion spent provides benefits to disadvantaged communities, and one-third of those investments were made directly in those communities.

CALIFORNIA'S CARBON PRICING & INVESTMENTS OVERVIEW



CAP-AND-TRADE DOLLARS AT WORK (2017)

California's Cap-and-Trade Program is the most comprehensive, effective, and well-designed carbon market on the planet. Today, the Program is linked with a similar program in Quebec and will link with a similar program in Ontario beginning in 2018. Nearly 40 countries and over 20 subnational entities – altogether representing nearly a quarter of global emissions – have developed, or are developing, emissions trading programs. Each of them looks to California and our linked Western Climate Initiative Partners as they design, implement, and refine their own programs.



Nearly 30,000 projects installing efficiency measures in homes



105,000+ rebates issued for zero-emission and plug-in hybrid vehicles



16,000+ acres of land preserved or restored



200+ transit agency projects funded, adding or expanding transit options



6,200+ trees planted in urban areas



1,100+ new affordable housing units under contract



50% of projects benefiting Disadvantaged Communities (\$614M)



140,000+ total projects implemented

Fostering Global Action

Through the State's leadership in the Cap-and-Trade Program, innovative sector-specific policies that are reducing technology costs and GHG emissions, and community-scale engagement and investments to reduce GHGs and promote equity, California is playing a significant role in addressing global climate change.

Governor Brown has stated that climate change is the most important issue of our lifetime, and has promoted scientifically sound approaches to address climate change in California and beyond. He has participated in international climate discussions at the United Nations headquarters in New York, the United Nations Climate Change Conference in Paris, the Vatican, and the Climate Summit of the Americas in Canada – calling on other subnational and national leaders to join California in the fight against climate change. He has signed climate change agreements with leaders from Chile, China, the Czech Republic, Israel, Japan, Mexico, the Netherlands, other North American states and provinces, and Peru. He has joined an unprecedented alliance of heads of state, city and state leaders – convened by the World Bank Group and International Monetary Fund – to urge countries and companies around the globe to put a price on carbon. And California is a founding member of the International Zero Emission Vehicle (ZEV) Alliance, a coalition of national and subnational governments working to accelerate the adoption of ZEVs and make all new

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1.20 BILLION PEOPLE

AND

\$28.8 TRILLION IN GDP

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cars zero emissions. Delegations from around the world travel to Sacramento to meet with the architects and implementers of California's climate policies to learn how to successfully combine strong greenhouse gas policies with a strong economy.

Perhaps most significant is the Under2Coalition. It is a global climate pact – spearheaded by Governor Brown – among states, provinces, countries, and cities all committing to do their part to limit the increase in global average temperatures below the dangerous levels. Signatories commit to either reducing greenhouse gas emissions 80 to 95 percent below 1990 levels by 2050 or achieving a per capita annual emission target of less than 2 metric tons by 2050. More than 200 jurisdictions from 38 countries and six continents have now signed or endorsed the agreement. Together, members of the Under2Coalition represent more than 1.2 billion people and \$28.8 trillion in GDP, equivalent to 39 percent of the global economy.

Unleashing the California Spirit

This Plan is a declaration of California's path forward. It builds on the State's successful approach to addressing climate change and harnesses the California spirit to propel a cleaner economy, while serving as an example for others.

But this Plan will not be successful on its own. Our collective, and individual, efforts must reach every sector of California's economy, and every community in the state. As California faces the challenge of climate change, it will succeed as it always has – through open, inclusive processes, through support of clean technology markets, and through a relentless pursuit of a healthy California for all.

There should be no doubt that California is united in understanding the need to act, and in the will to act. Investments in clean, low-carbon options will pay off – for the environment and the economy. Investments and training in education and workforce development for a lower carbon economy are a critical part of this transition.

This Plan is only the beginning. All of the measures in the Plan will be developed in their own public process, shaped not just by the vision of this Plan, but also by the best understanding of the technology, costs and impacts on communities – and by input from a broad range of stakeholders and perspectives with the recognition that achieving the 2030 target is a milestone on our way to the deeper GHG reductions needed to protect the environment and our way of life. The Plan also proposes developing a long-term funding plan to inform future appropriations necessary to achieve our long-term targets, which will send clear market and workforce development signals.

Climate change presents unprecedented challenges, but just as we have always done, Californians will tackle them with innovation, inclusion and ultimately, success.

Chapter 1

INTRODUCTION

Background

In November 2016, California Governor Edmund G. Brown affirmed California's role in the fight against climate change in the United States, noting, "We will protect the precious rights of our people and continue to confront the existential threat of our time—devastating climate change." By working to reduce the threat facing the State and setting an example, California continues to lead in the climate arena. This Scoping Plan for Achieving California's 2030 Greenhouse Gas Target (Scoping Plan or 2017 Scoping Plan) identifies how the State can reach our 2030 climate target to reduce greenhouse gas (GHG) emissions by 40 percent from 1990 levels, and substantially advance toward our 2050 climate goal to reduce GHG emissions by 80 percent below 1990 levels. By selecting and pursuing a sustainable and clean economy path for 2030, the State will continue to successfully execute existing programs, demonstrate the coupling of economic growth and environmental progress, and enhance new opportunities for engagement within the State to address and prepare for climate change.

This Scoping Plan builds on and integrates efforts already underway to reduce the State's GHG, criteria pollutant, and toxic air contaminant emissions. Successful implementation of existing programs has put California on track to achieve the 2020 target. Programs such as the Low Carbon Fuel Standard and Renewables Portfolio Standard are delivering cleaner fuels and energy, the Advanced Clean Cars Program has put more than a quarter million clean vehicles on the road, and the Sustainable Freight Action Plan will result in efficient and cleaner systems to move goods throughout the State. Enhancing and implementing these ongoing efforts puts California on the path to achieving the 2030 target. This Scoping Plan relies on these, and other, foundational programs paired with an extended, more stringent Cap-and-Trade Program, to deliver climate, air quality, and other benefits.

In developing this Scoping Plan, it is paramount that we continue to build on California's success by taking effective actions. We must rapidly produce real results to avoid the most catastrophic impacts of climate change. The Scoping Plan identifies policies based on solid science and identifies additional research needs, while also recognizing the need for flexibility in the face of a changing climate. Ongoing research to better understand systems where our knowledge is weaker will allow for additional opportunities to set targets and identify actionable policies. Further, a long-term funding plan to inform future appropriations is critical to achieve our long-term targets, which will send clear market and workforce development signals.

Climate Legislation and Directives

California has made progress on addressing climate change during periods of both Republican and Democratic national and State administrations. California's governors and legislature prioritize public health and the environment. A series of executive orders and laws have generated policies and actions across State government, among local and regional governments, and within industry. These policies also have encouraged collaboration with federal agencies and spurred partnerships with many jurisdictions beyond California's borders. Moving forward, California will continue its pursuit of collaborations and advocacy for action to address climate change. The following list provides a summary of major climate legislation and executive orders that have shaped California's climate programs.

Assembly Bill 32 (AB 32) (Nuñez, Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006.

- Cut the State's GHG emissions to 1990 levels by 2020 with maintained and continued reductions post 2020.
- First comprehensive climate bill in California, a defining moment in the State's long history of environmental stewardship.

- Secured the State's role as a national and global leader in reducing GHGs.

Pursuant to AB 32, the California Air Resources Board (CARB or Board) prepared and adopted the initial Scoping Plan to *"identify and make recommendations on direct emissions reductions measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and non-monetary incentives"* in order to achieve the 2020 goal, and to achieve *"the maximum technologically feasible and cost-effective GHG emissions reductions"* by 2020 and maintain and continue reductions beyond 2020. AB 32 requires CARB to update the Scoping Plan at least every five years.

Executive Order B-30-15

In his January 2015 inaugural address, Governor Brown identified actions in five key climate change strategy "pillars" necessary to meet California's ambitious climate change goals. These five pillars are:

- Reducing today's petroleum use in cars and trucks by up to 50 percent.
- Increasing from one-third to 50 percent our electricity derived from renewable sources.
- Doubling the efficiency savings achieved at existing buildings and making heating fuels cleaner.
- Reducing the release of methane, black carbon, and other short-lived climate pollutants.
- Managing farm and rangelands, forests, and wetlands so they can store carbon.

Consistent with these goals, Governor Brown signed Executive Order B-30-15 in April 2015:

- Establishing a California GHG reduction target of 40 percent below 1990 levels by 2030.
- Calling on CARB, in coordination with sister agencies, to update the AB 32 Climate Change Scoping Plan to incorporate the 2030 target.
- Building out the "sixth pillar" of the Governor's strategy—to safeguard California in the face of a changing climate—highlighting the need to prioritize actions to reduce GHG emissions and build resilience in the face of a changing climate.

Senate Bill 350 (SB 350) (De Leon, Chapter 547, Statutes of 2015), Golden State Standards

- Required the State to set GHG reduction planning targets through Integrated Resource Planning in the electricity sector as a whole and among individual utilities and other electricity providers (collectively known as load serving entities).
- Codified an increase in the Renewables Portfolio Standard (RPS) to 50 percent by 2030¹ and doubled the energy savings required in electricity and natural gas end uses as discussed in the Governor's inaugural address.

Senate Bill 32 (SB 32) (Pavley, Chapter 249, Statutes of 2016), California Global Warming Solutions Act of 2016: emissions limit and Assembly Bill 197 (AB 197) (E. Garcia, Chapter 250, Statutes of 2016), State Air Resources Board: greenhouse gases: regulations.

SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's Executive Order B-30-15. The 2030 target reflects the same science that informs the agreement reached in Paris by the 2015 Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at keeping the global temperature increase below 2 degrees Celsius (°C). The California 2030 target represents the most ambitious GHG reduction goal for North America. Based on the emissions reductions directed by SB 32, the annual 2030 statewide target emissions level for California is 260 million metric tons of carbon dioxide equivalent (MMTCO₂e).

The companion bill to SB 32, AB 197, provides additional direction to CARB on the following areas related to the adoption of strategies to reduce GHG emissions.

- Requires annual posting of GHG, criteria, and toxic air contaminant data throughout the State, organized by local and sub-county level for stationary sources and by at least a county level for mobile sources.
- Requires CARB, when adopting rules and regulations to achieve emissions reductions

¹ <http://www.cpuc.ca.gov/renewables/>

and to protect the State's most affected and disadvantaged communities, to consider the social costs of GHG emissions and prioritize both of the following:

- Emissions reductions rules and regulations that result in direct GHG emissions reductions at large stationary sources of GHG emissions and direct emissions reductions from mobile sources.
- Emissions reductions rules and regulations that result in direct GHG emissions reductions from sources other than those listed above.
- Directs CARB, in the development of each scoping plan, to identify for each emissions reduction measure:
 - The range of projected GHG emissions reductions that result from the measure.
 - The range of projected air pollution reductions that result from the measure.
 - The cost-effectiveness, including avoided social costs, of the measure.

CARB has begun the process to implement the provisions of AB 197. For instance, CARB is already posting GHG, criteria pollutant and toxic air contaminant data. CARB also incorporated air emissions data into a visualization tool in December 2016 in response to direction in AB 197 to provide easier access to this data.²

Senate Bill 1383 (SB 1383) (Lara, Chapter 395, Statutes of 2016), Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills

- Requires the development, adoption, and implementation of a Short-Lived Climate Pollutant Strategy.^{3, 4}
- Includes the following specific goals for 2030 from 2013 levels:
 - 40 percent reduction in methane.
 - 40 percent reduction in hydrofluorocarbon gases.
 - 50 percent reduction in anthropogenic black carbon.⁵

Short-lived climate pollutants (SLCPs), such as black carbon, fluorinated gases, and methane, are powerful climate forcers that have a dramatic and detrimental effect on air quality, public health, and climate change. These pollutants create a warming influence on the climate that is many times more potent than that of carbon dioxide. In March 2017, the Board adopted the Short-Lived Climate Pollutant Reduction Strategy (SLCP Strategy) establishing a path to decrease GHG emissions and displace fossil-based natural gas use. Strategies include avoiding landfill methane emissions by reducing the disposal of organics through edible food recovery, composting, in-vessel digestion, and other processes; and recovering methane from wastewater treatment facilities, and manure methane at dairies, and using the methane as a renewable source of natural gas to fuel vehicles or generate electricity. The SLCP Strategy also identifies steps to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use. Lastly, the SLCP Strategy also identifies measures that can reduce hydrofluorocarbon (HFC) emissions at national and international levels, in addition to State-level action that includes an incentive program to encourage the use of low-Global Warming Potential (GWP) refrigerants, and limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment.

Assembly Bill 1504 (AB 1504) (Skinner, Chapter 534, Statutes of 2010): Forest resources: carbon sequestration

- Requires the Board of Forestry and Fire Protection to adopt district forest practice rules and regulations in accordance with specified policies to, among other things, assure the continuous growing and harvesting of commercial forest tree species.
- Requires the Board of Forestry and Fire Protection to ensure that its rules and regulations that govern the harvesting of commercial forest tree species consider the capacity of forest resources to sequester carbon dioxide emissions sufficient to meet or exceed the sequestration target of 5 million metric tons of carbon dioxide annually, as established in the first AB 32 Climate Change Scoping Plan.

² CARB. 2016. CARB's Emission Inventory Activities. www.arb.ca.gov/ei/ei.htm

³ CARB. Reducing Short-Lived Climate Pollutants in California. www.arb.ca.gov/cc/shortlived/shortlived.htm

⁴ Senate Bill No. 605. leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB605

⁵ Senate Bill No.1383. leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383

Senate Bill 1386 (SB 1386) (Wolk, Chapter 545, Statutes of 2016): Resource conservation, natural and working lands

- Declares it the policy of the State that protection and management of natural and working lands, as defined, is an important strategy in meeting the State's GHG reduction goals.
- Requires State agencies to consider protection and management of natural and working lands in establishing policies and grant criteria, and in making expenditures, and "implement this requirement in conjunction with the State's other strategies to meet its greenhouse gas emissions reduction goals."

Assembly Bill 398 (AB 398) (E. Garcia, Chapter 135, Statutes of 2017): California Global Warming Solutions Act of 2006: market-based compliance mechanisms: fire prevention fees: sales and use tax manufacturing exemption

- Clarifies the role of the State's Cap-and-Trade Program from January 1, 2021, through December 31, 2030, continuing elements of the current program, but requiring CARB to make some post-2020 refinements.
- Establishes a Compliance Offsets Protocol Task Force to provide guidance to CARB in approving new offset protocols that increase projects with direct, in-state environmental benefits.
- Establishes the Independent Emissions Market Advisory Committee to report annually on the environmental and economic performance of the Cap-and-Trade Program and other climate policies.
- Identifies legislative priorities for allocating auction revenue proceeds, to include but not be limited to: air toxic and criteria air pollutants from stationary and mobile sources; low- and zero-carbon transportation alternatives; sustainable agricultural practices that promote transition to clean technology, water efficiency, and improved air quality; healthy forests and urban greening; short-lived climate pollutants; climate adaptation and resiliency; and climate and clean energy research.

In addition, AB 398 requires CARB to designate the Cap-and-Trade Program as the mechanism for reducing GHG emissions from petroleum refineries and oil and gas production facilities in this update to the Scoping Plan. With respect to local air districts, AB 398 states that it does not limit or expand the district's existing authority, including the authority to regulate criteria pollutants and toxic air contaminants, except that it prohibits an air district from adopting or implementing a rule for the specific purpose of reducing emissions of carbon dioxide from stationary sources that are subject to the Cap-and-Trade Program.

Assembly Bill 617 (AB 617) (C. Garcia, Chapter 136, Statutes of 2017): Nonvehicular air pollution: criteria air pollutants and toxic air contaminants.

This bill was passed as a companion to AB 398 (E. Garcia, 2017) to strengthen air quality monitoring and reduce air pollution at a community level, in communities affected by a high cumulative burden of exposure to pollution. CARB is required to prepare a monitoring plan by October 1, 2018, that assesses the State's current air monitoring network with recommendations for a set of high-priority locations around the State to deploy community focused air monitoring systems. Local air districts must deploy air monitoring systems in the selected high priority locations by July 1, 2019. Thereafter, CARB will evaluate and select additional locations for community air monitoring on an annual basis. The air districts must also deploy air monitoring systems within one year of CARB's selection of the high-priority locations. In addition to the monitoring plan, the bill requires CARB to develop a statewide strategy to reduce criteria pollutants and toxic air contaminants (TACs) in communities affected by high cumulative exposure burdens through approved community emissions reduction programs developed by local air districts, in partnership with residents in the affected communities; requires CARB to establish a uniform system of annual reporting of criteria pollutants and TACs for the existing statewide air monitoring network; and expedites implementation of best available retrofit control technology in non-attainment areas.

Tables summarizing the legislation described in this section, along with other climate related legislation and programs are included in Appendix H and organized by sector.

Initial Scoping Plan and First Update to the Scoping Plan

The Initial Scoping Plan⁶ in 2008 presented the first economy-wide approach to reducing emissions and highlighted the value of combining both carbon pricing with other complementary programs to meet California's 2020 GHG emissions target while ensuring progress in all sectors. The coordinated set of policies in the Initial Scoping Plan employed strategies tailored to specific needs, including market-based compliance mechanisms, performance standards, technology requirements, and voluntary reductions. The Initial Scoping Plan also described a conceptual design for a cap-and-trade program that included eventual linkage to other cap-and-trade programs to form a larger regional trading program.

AB 32 requires CARB to update the scoping plan at least every five years. The First Update to the Scoping Plan⁷ (First Update), approved in 2014, presented an update on the program and its progress toward meeting the 2020 limit. It also developed the first vision for long-term progress beyond 2020. In doing so, the First Update laid the groundwork for the goals set forth in Executive Orders S-3-05⁸ and B-16-2012⁹. It also identified the need for a 2030 mid-term target to establish a continuum of actions to maintain and continue reductions, rather than only focusing on targets for 2020 or 2050.

Building on California's Environmental Legacy

California's successful climate policies and programs have already delivered emissions reductions resulting from cleaner, more fuel-efficient cars and zero emission vehicles (ZEVs), low carbon fuels, increased renewable energy, and greater waste diversion from landfills; water conservation; improved forest management; and improved energy efficiency of homes and businesses. Beyond GHG reductions, these policies and programs also provide an array of benefits including improved public health, green jobs, and more clean energy choices. The 2030 GHG emissions reduction target in SB 32 will ensure that the State maintains this momentum beyond 2020, mindful of the State's population growth and needs. This Scoping Plan identifies a path to simultaneously make progress on the State's climate goals as well as complement other efforts such as the State Implementation Plans (SIPs) and community emissions reduction programs to help improve air quality in all parts of the State.

California's future climate strategy will require continued contributions from all sectors of the economy, including enhanced focus on zero- and near-zero emission (ZE/NZE) vehicle technologies; continued investment in renewables, such as solar roofs, wind, and other types of distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for GHG reductions at stationary sources complement efforts of local air pollution control and air quality management districts (air districts) to tighten criteria and toxics air pollution emission limits on a broad spectrum of industrial sources, including in disadvantaged communities historically located adjacent to large stationary sources. Finally, meeting the State's climate, public health, and environmental goals will entail understanding, quantifying, and addressing emissions impacts from land use decisions at all governmental levels.

Purpose of the 2017 Scoping Plan

This Scoping Plan incorporates, coordinates, and leverages many existing and ongoing efforts and identifies new policies and actions to accomplish the State's climate goals. Chapter 2 of this document includes a description of a suite of specific actions to meet the State's 2030 GHG limit. In addition, Chapter 4 provides a broader description of the many actions and proposals being explored across the sectors, including the natural resources sector, to achieve the State's mid and long-term climate goals.

Guided by legislative direction, the actions identified in this Scoping Plan reduce overall GHG emissions in California and deliver policy signals that will continue to drive investment and certainty in a low carbon

6 CARB. Initial AB 32 Climate Change Scoping Plan. Available at: www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

7 CARB. First Update to the AB 32 Scoping Plan. Available at: www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm

8 www.gov.ca.gov/news.php?id=1861

9 www.gov.ca.gov/news.php?id=17472

economy. This Scoping Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while identifying new, technologically feasible, and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. The Plan includes policies to require direct GHG reductions at some of the State's largest stationary sources and mobile sources. These policies include the use of lower GHG fuels, efficiency regulations, and the Cap-and-Trade Program, which constrains and reduces emissions at covered sources.

Process for Developing the 2017 Scoping Plan

This Scoping Plan was developed in coordination with State agencies, through engagement with the Legislature, and with open and transparent opportunities for stakeholders and the public to engage in workshops and other meetings. Development also included careful consideration of, and coordination with, other State agency plans and regulations, including the Cap-and-Trade Program, Low Carbon Fuel Standard (LCFS), State Implementation Plan, California Sustainable Freight Action Plan, California Transportation Plan 2040, Forest Carbon Plan, and the Short-Lived Climate Pollutant Strategy, among others.

To inform this Scoping Plan, CARB, in collaboration with the Governor's Office and other State agencies, solicited comments and feedback from affected stakeholders, including the public, and the Environmental Justice Advisory Committee (EJAC or Committee). The process to update the 2017 Scoping Plan began with the Governor's Office Pillar Symposia, which included over a dozen public workshops, and featured a series of Committee and environmental justice community meetings.¹⁰

One key message conveyed to CARB during engagement with the legislature, EJAC, and environmental justice communities was the need to emphasize reductions at large stationary sources, with a particular focus on multi-pollutant strategies for these sources to reduce GHGs and harmful criteria and toxic air pollutants that result in localized health impacts, especially in disadvantaged communities. Other consistent feedback for CARB included the need for built and natural infrastructure improvements that enhance quality of life, increase access to safe and viable transportation options, and improve physical activity and related health outcomes.

Updated Climate Science Supports the Need for More Action

Climate scientists agree that global warming and other shifts in the climate system observed over the past century are caused by human activities. These recorded changes are occurring at an unprecedented rate.¹¹ According to new research, unabated GHG emissions could allow sea levels to rise up to ten feet by the end of this century—an outcome that could devastate coastal communities in California and around the world.¹²

California is already feeling the effects of climate change, and projections show that these effects will continue and worsen over the coming centuries. The impacts of climate change have been documented by the Office of Environmental Health Hazard Assessment (OEHHA) in the Indicators of Climate Change Report, which details the following changes that are occurring already:¹³

- A recorded increase in annual average temperatures, as well as increases in daily minimum and maximum temperatures.
- An increase in the occurrence of extreme events, including wildfire and heat waves.
- A reduction in spring runoff volumes, as a result of declining snowpack.
- A decrease in winter chill hours, necessary for the production of high-value fruit and nut crops.
- Changes in the timing and location of species sightings, including migration upslope of flora and fauna, and earlier appearance of Central Valley butterflies.

10 www.arb.ca.gov/cc/scopingplan/scopingplan.htm

11 Cook, J., et al. 2016. Consensus on consensus: A synthesis of consensus estimates on human-caused global warming. *Environmental Research Letters* 11:048002 doi:10.1088/1748-9326/11/4/048002. iopscience.iop.org/article/10.1088/1748-9326/11/4/048002.

12 California Ocean Protection Council. 2017. Rising Seas in California: An Update On Sea-Level Rise Science. www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf

13 Office of Environmental Health Hazard Assessment, Indicators of Climate Change (website): oehha.ca.gov/climate-change/document/indicators-climate-change-california

In addition to these trends, the State's current conditions point to a changing climate. California's recent historic drought incited land subsidence, pest invasions that killed over 100 million trees, and water shortages throughout the State. Recent scientific studies show that such extreme drought conditions are more likely to occur under a changing climate.^{14,15} The total statewide economic cost of the 2013–2014 drought was estimated at \$2.2 billion, with a total loss of 17,100 jobs.¹⁶ In the Central Valley, the drought cost California agriculture about \$2.7 billion and more than 20,000 jobs in 2015, which highlights the critical need for developing drought resilience.¹⁷ Drought affects other sectors as well. An analysis of the amount of water consumed in meeting California's energy needs between 1990 and 2012 shows that while California's energy policies have supported climate mitigation efforts, the performance of these policies have increased vulnerability to climate impacts, especially greater hydrologic uncertainty.¹⁸

Several publications carefully examined the potential role of climate change in the recent California drought. One study examined both precipitation and runoff in the Sacramento and San Joaquin River basins, and found that 10 of the past 14 years between 2000 and 2014 have been below normal, and recent years have been the driest and hottest in the full instrumental record from 1895 through November 2014.¹⁹ In another study, the authors show that the increasing co-occurrence of dry years with warm years raises the risk of drought, highlighting the critical role of elevated temperatures in altering water availability and increasing overall drought intensity and impact.²⁰ Generally, there is growing risk of unprecedented drought in the western United States driven primarily by rising temperatures, regardless of whether or not there is a clear precipitation trend.²¹

According to the U.S. Forest Service report, National Insect and Disease Forest Risk Assessment, 2013–2027,²² California is at risk of losing 12 percent of the total area of forests and woodlands in the State due to insects and disease, or over 5.7 million acres. Some species are expected to lose significant amounts of their total basal area (e.g., whitebark pine is projected to lose 60 percent of its basal area; and lodgepole pine is projected to lose 40 percent). While future climate change is not modeled within the risk assessment, and current drought conditions are not accounted for in these estimates, the projected climate changes over a 15 year period (2013–2027) are expected to significantly increase the number of acres at risk, and will increase the risk from already highly destructive pests such as the mountain pine beetle. Extensive tree mortality is already prevalent in California. The western pine beetle and other bark beetles have killed a majority of the ponderosa pine in the foothills of the central and southern Sierra Nevada Mountains. A recent aerial survey by the U.S. Forest Service identified more than 100 million dead trees in California.²³ As there is usually a lag time between drought years and tree mortality, we are now beginning to see a sharp rise in mortality from the past four years of drought. In response to the very high levels of tree mortality, Governor Brown issued an Emergency Proclamation on October 30, 2015, that directed state agencies to identify and take action to reduce wildfire risk through the removal and use of the dead trees.

14 Diffenbaugh, N., D. L. Swain, and D. Touma. 2015. Anthropogenic Warming has Increased Drought Risk in California. *Proceedings of the National Academy of Sciences* 112(13): 3931–3936.

15 Cayan, D., T. Das, D. W. Pierce, T. P. Barnett, M. Tyree, and A. Gershunov. 2010. Future Dryness in the Southwest US and Hydrology of the Early 21st Century Drought. *Proceedings of the National Academy of Sciences* 107(50): 21272–21276.

16 Howitt, R., J. Medellin-Azuara, D. MacEwan, J. Lund, and D. Summer. 2014. Economic Impacts of 2014 Drought on California Agriculture. watershed.ucdavis.edu/files/biblio/DroughtReport_23July2014_0.pdf.

17 Williams, A. P., et al. 2015. Contribution of anthropogenic warming to California drought during 2012–2014. *Geophysical Research Letters* <http://onlinelibrary.wiley.com/doi/10.1002/2015GL064924/abstract>.

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20 Diffenbaugh, N. S., D. L. Swain, and D. Touma. 2015. Anthropogenic warming has increased drought risk in California. *Proceedings of the National Academy of Sciences of the United States of America*. 10.1073/pnas.1422385112. www.pnas.org/content/112/13/3931.full.pdf

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22 Krist, F.J. Jr., J.R. Ellenwood, M.E. Woods, A.J. McMahan, J.P. Cowardin, D.E. Ryerson, F.J. Sapio, M.O. Zweifler, S.A. Romero. 2014. FHTET 2013 – 2027 National Insect & and Disease Forest Risk Assessment. FHTET-14-01 January 2014. Available at: http://www.fs.fed.us/foresthealth/technology/pdfs/2012_RiskMap_Report_web.pdf

23 USDA. 2016. New Aerial Survey Identifies More Than 100 Million Dead Trees in California. www.usda.gov/wps/portal/usda/usdahome?contentid=2016/11/0246.xml&contentidonly=true



CLIMATE IMPACTS AT THE COMMUNITY LEVEL

The California Energy Commission Cal-Adapt tool provides information about future climate conditions to help better understand how climate will impact local communities.

cal-adapt.org

A warming climate also causes sea level to rise; first, by warming the oceans which causes the water to expand, and second, by melting land ice which transfers water to the ocean. Even if storms do not become more intense or frequent, sea level rise itself will magnify the adverse impact of any storm surge and high waves on the California coast. Some observational studies report that the largest waves are already getting higher and winds are getting stronger.²⁴ Further, as temperatures warm and GHG concentrations increase more carbon dioxide dissolves in the ocean, making it more acidic. More acidic ocean water affects a wide variety of marine species, including species that people rely on for food. Recent projections indicate that if no significant GHG mitigation efforts are taken, the San Francisco Bay Area may experience sea level rise between 1.6 to 3.4 feet, and in an extreme scenario involving the rapid loss of the Antarctic ice sheet, sea levels along California's coastline could rise up to 10 feet by 2100.²⁵ This change is likely to have substantial ecological and economic consequences in California and worldwide.²⁶

While more intense dry periods are anticipated under warmer conditions, extremes on the wet end of the spectrum are also expected to increase due to more frequent warm, wet atmospheric river events and a higher proportion of precipitation falling as rain instead of snow. In recent years, atmospheric rivers have also been recognized as the cause of the large majority of major floods in rivers

all along the U.S. West Coast and as the source of 30-50 percent of all precipitation in the same region.²⁷ These extreme precipitation events, together with the rising snowline, often cause devastating floods in major river basins (e.g., California's Russian River). It was estimated that the top 50 observed floods in the U.S. Pacific Northwest were due to atmospheric rivers.²⁸ Looking ahead, the frequency and severity of atmospheric rivers on the U.S. West Coast will increase due to higher atmospheric water vapor that occurs with rising temperature, leading to more frequent flooding.^{29, 30}

Climate change can drive extreme weather events such as coastal storm surges, drought, wildfires, floods, and heat waves, and disrupt environmental systems including our forests and oceans. As GHG emissions continue to accumulate and climate disruption grows, such destructive events will become more frequent. Several recent studies project increased precipitation within hurricanes over ocean regions.^{31, 32} The primary physical mechanism for this increase is higher water vapor in the warmer atmosphere, which enhances moisture convergence in a storm for a given circulation strength. Since hurricanes are responsible for many of the most extreme precipitation events, such events are likely to become more extreme. Anthropogenic warming by

24 National Research Council of the National Academy of Sciences. 2012. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future. National Academies Press.

25 California Ocean Protection Council. 2017. Rising Seas in California: An Update On Sea-Level Rise Science. www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf

26 Chan, F., et al. 2016. The West Coast Ocean Acidification and Hypoxia Science Panel: Major Findings, Recommendations, and Actions. California Ocean Science Trust, Oakland, California, USA.

27 Dettinger, M. D. 2013. Atmospheric rivers as drought busters on the U.S. West Coast. *Journal of Hydrometeorology* 14:1721-1732, doi:10.1175/JHM-D-13-02.1. journals.ametsoc.org/doi/abs/10.1175/JHM-D-13-02.1.

28 Warner, M. D., C. F. Mass, and E. P. Salathé. 2012. Wintertime extreme precipitation events along the Pacific Northwest coast: Climatology and synoptic evolution. *Monthly Weather Review* 140:2021-43. <http://journals.ametsoc.org/doi/abs/10.1175/MWR-D-11-00197.1>.

29 Hagos, S. M., L. R. Leung, J.-H. Yoon, J. Lu, and Y. Gao, 2016: A projection of changes in landfalling atmospheric river frequency and extreme precipitation over western North America from the Large Ensemble CESM simulations. *Geophysical Research Letters*, 43 (3), 357-1363, <http://onlinelibrary.wiley.com/doi/10.1002/2015GL067392/epdf>.

30 Payne, A. E., and G. Magnusdottir, 2015: An evaluation of atmospheric rivers over the North Pacific in CMIP5 and their response to warming under RCP 8.5. *Journal of Geophysical Research: Atmospheres*, 120 (21), 11,173-11,190, <http://onlinelibrary.wiley.com/doi/10.1002/2015JD023586/epdf>.

31 Easterling, D.R., K.E. Kunkel, M.F. Wehner, and L. Sun, 2016: Detection and attribution of climate extremes in the observed record. *Weather and Climate Extremes*, 11, 17-27. <http://dx.doi.org/10.1016/j.wace.2016.01.001>.

32 NAS, 2016: Attribution of Extreme Weather Events in the Context of Climate Change. The National Academies Press, Washington, DC, 186 pp. <http://dx.doi.org/10.17226/21852>.

the end of the 21st century will likely cause tropical cyclones globally to become more intense on average. This change implies an even larger percentage increase in the destructive potential per storm, assuming no changes in storm size.^{33,34} Thus, the historical record, which once set our expectations for the traditional range of weather and other natural events, is becoming an increasingly unreliable predictor of the conditions we will face in the future. Consequently, the best available science must drive effective climate policy.

California is committed to further supporting new research on ways to mitigate climate change and how to understand its ongoing and projected impacts. California's Fourth Climate Change Assessment and Indicators of Change Report will further update our understanding of the many impacts from climate change in a way that directly informs State agencies' efforts to safeguard the State's people, economy, and environment.^{35, 36}

Together, historical data, current conditions, and future projections provide a picture of California's changing climate, with two important messages:

- Change is already being experienced and documented across California, and some of these changes have been directly linked to changing climatic conditions.
- Even with the uncertainty in future climate conditions, every scenario estimates further change in future conditions.

It is critical that California continue to take steps to reduce GHG emissions in order to avoid the worst of the projected impacts of climate change. At the same time, the State is taking steps to make the State more resilient to ongoing and projected climate impacts as laid out by the Safeguarding California Plan.³⁷ The Safeguarding California Plan is being updated in 2017 to present new policy recommendations and provide a roadmap of all the actions and next steps that state government is taking to adapt to the ongoing and inevitable effects of climate change. The Draft Safeguarding California Plan³⁸ is available and will be finalized after workshops and public comments. California's continuing efforts are vital steps toward minimizing the impact of GHG emissions and a three-pronged approach of reducing emissions, preparing for impacts, and conducting cutting-edge research can serve as a model for action.

California's Greenhouse Gas Emissions and the 2030 Target

Progress Toward Achieving the 2020 Limit

AB 32 directs CARB to develop and track GHG emissions and progress toward the 2020 statewide GHG target. California is on track to achieve the target while also reducing criteria pollutants and toxic air contaminants and supporting economic growth. As shown in Figure 1, in 2015, total GHG emissions decreased by 1.5 MMTCO₂e compared to 2014, representing an overall decrease of 10 percent since peak levels in 2004. The 2015 GHG Emission Inventory and a description of the methodology updates can be accessed at: www.arb.ca.gov/cc/inventory/inventory.htm.

Per California Health and Safety Code section 38505, CARB monitors and regulates seven GHGs to reduce emissions: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF₃). The fluorinated gases are also referred to as "high global warming potential gases" (high-GWP gases). California's annual statewide GHG emission inventory has historically been the primary tool for tracking GHG emissions trends. Figure 1 provides the GHG inventory trend. Additional information on the methodology for the GHG inventory can also be found at: www.arb.ca.gov/cc/inventory/data/data.htm.

33 Sobel, A.H., S.J. Camargo, T.M. Hall, C.-Y. Lee, M.K. Tippet, and A.A. Wing, 2016: Human influence on tropical cyclone intensity. *Science*, 353, 242-246.

34 Kossin, J. P., K. A. Emanuel, and S. J. Camargo, 2016: Past and projected changes in western North Pacific tropical cyclone exposure. *Journal of Climate*, 29 (16), 5725-5739, <https://doi.org/10.1175/JCLI-D-16-0076.1>.

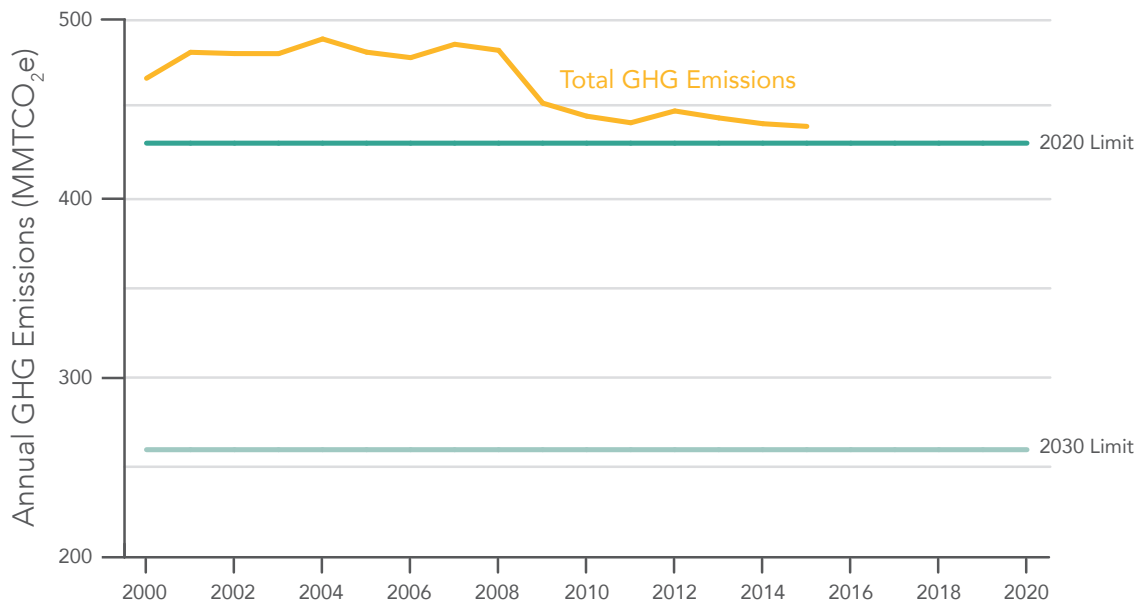
35 California's Fourth Climate Change Assessment. <http://resources.ca.gov/climate/safeguarding/research/>

36 Office of Environmental Health Hazard Assessment, Indicators of Climate Change (website): <https://oehha.ca.gov/climate-change/document/indicators-climate-change-california>

37 California Natural Resources Agency. 2017. Safeguarding California. <http://resources.ca.gov/climate/safeguarding/>

38 <http://resources.ca.gov/climate/safeguarding/>

FIGURE 1: CALIFORNIA GHG INVENTORY TREND



Carbon dioxide is the primary GHG emitted in California, accounting for 84 percent of total GHG emissions in 2015, as shown in Figure 2 below. Figure 3 illustrates that transportation, primarily on-road travel, is the single largest source of CO₂ emissions in the State. Upstream transportation emissions from the refinery and oil and gas sectors are categorized as CO₂ emissions from industrial sources and constitute about 50 percent of the industrial source emissions. When these emissions sources are attributed to the transportation sector, the emissions from that sector amount to approximately half of statewide GHG emissions. In addition to transportation, electricity production, and industrial and residential sources also are important contributors to CO₂ emissions.

Figures 2 and 3 show State GHG emission contributions by GHG and sector based on the 2015 GHG Emission Inventory. Emissions in Figure 3 are depicted by Scoping Plan sector, which includes separate categories for high-GWP and recycling/waste emissions that are otherwise typically included within other economic sectors.

FIGURE 2: EMISSIONS BY GHG

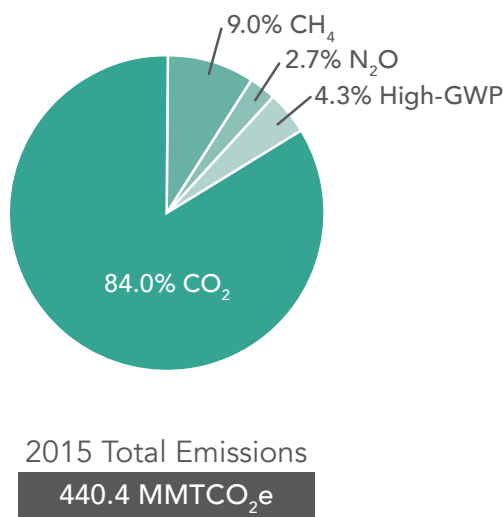
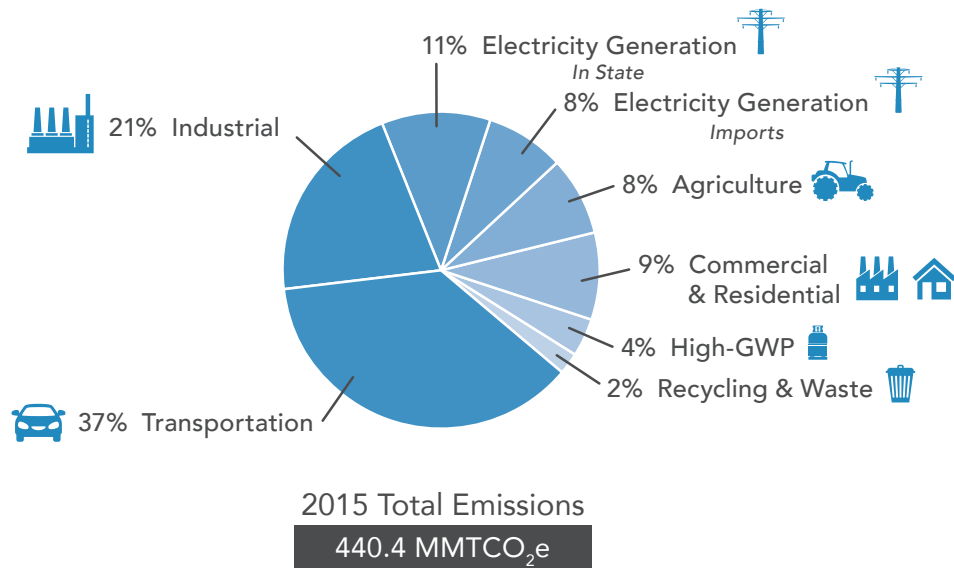
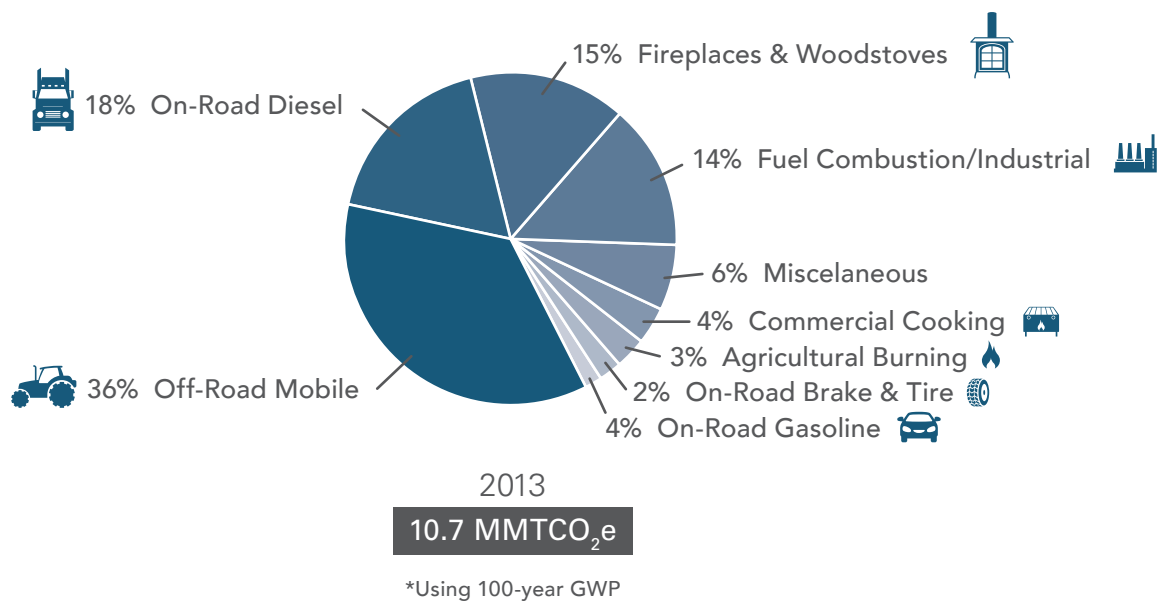


FIGURE 3: EMISSIONS BY SCOPING PLAN SECTOR



In addition, CARB has developed a statewide emission inventory for black carbon in support of the SLCP Strategy, which is reported in two categories: non-forestry (anthropogenic) sources and forestry sources.³⁹ The black carbon inventory will help support implementation of the SLCP Strategy, but is not part of the State’s GHG Inventory that tracks progress towards the State’s climate targets. The State’s major anthropogenic sources of black carbon include off-road transportation, on-road transportation, residential wood burning, fuel combustion, and industrial processes (Figure 4). The forestry category includes non-agricultural prescribed burning and wildfire emissions.

FIGURE 4: CALIFORNIA 2013 ANTHROPOGENIC BLACK CARBON EMISSION SOURCES*



The exchange of CO₂ between the atmosphere and California’s natural and working lands sector is currently unquantified and therefore, excluded from the State’s GHG Inventory. A natural and working lands carbon inventory is essential for monitoring land-based activities that may increase or decrease carbon sequestration over time. CARB staff is working to develop a comprehensive inventory of GHG fluxes from all of California’s

39 Per SB 1383, the SLCP Strategy only addresses anthropogenic black carbon.

natural and working lands using the Intergovernmental Panel on Climate Change (IPCC) design principles. CARB released the Natural and Working Lands Inventory with the 2030 Target Scoping Plan Update Discussion Draft.⁴⁰ This inventory provides an estimate of GHG emissions reductions and changes in carbon stock from some carbon pools in agricultural and natural and working lands. The CARB Natural and Working Lands Inventory includes an inventory of carbon stocks, stock-change (and by extension GHG flux associated with stock-change) with some attribution by disturbance process for the analysis period 2001-2010. Disturbance processes include activities such as conversion from one land category to a different category, fire, and harvest. The CARB Natural and Working Lands Inventory covers varieties of forests and woodlands, grasslands, and wetlands (biomass-stock-change only). The Inventory includes default carbon densities for croplands and urban/developed lands to facilitate stock-change estimation for natural lands that convert to cropland, natural lands that convert to developed lands, and for croplands that convert to developed lands.

Greenhouse Gas Emissions Tracking

As described above, California maintains an economy-wide GHG inventory for the State that is consistent with IPCC practices to allow for comparison of statewide GHG emissions with those at the national level and with other international GHG inventories. Statewide GHG emissions calculations use many data sources, including data from other State and federal agencies. However, the primary source of data comes from reports submitted to CARB through the Regulation for the Mandatory Reporting of GHG Emissions (MRR). MRR requires facilities and entities with more than 10,000 metric tons of carbon dioxide equivalent (MTCO₂e) of combustion and process emissions, all facilities belonging to certain industries, and all electric power entities to submit an annual GHG emissions data report directly to CARB. Reports from facilities and entities that emit more than 25,000 MTCO₂e are verified by a CARB-accredited third-party verification body. More information on MRR emissions reports can be found at: www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm.

All data sources used to develop the GHG Emission Inventory are listed in inventory supporting documentation at: www.arb.ca.gov/cc/inventory/data/data.htm.

Other State agencies, nonprofit organizations, and research institutions are developing and testing methodologies and models to quantify GHG fluxes from California's natural and working lands. CARB's ongoing work on the Natural and Working Lands Inventory will serve as one source of data to gauge the scope of GHG reduction potential from California's natural and working lands and monitor progress over time. CARB will evaluate other data sources and methodologies to validate or support the CARB inventory or project-scale tracking. Interagency work is also underway to integrate and account for the land use and management impacts of development, transportation, housing, and energy policies.

Greenhouse gas mitigation action may cross geographic borders as part of international and subnational collaboration, or as a natural result of implementation of regional policies. In addition to the State's existing GHG inventory, CARB has begun exploring how to build an accounting framework that also utilizes existing program data to better reflect the broader benefits of our policies that may be happening outside of the State. For GHG reductions outside of the State to be attributed to our programs, those reductions must be real and quantifiable, without any double counting, including claims to those reductions by other jurisdictions. CARB is collaborating with other jurisdictions to ensure GHG accounting rules are consistent with international best practices. Robust accounting rules will instill confidence in the reductions claimed and maintain support for joint action across jurisdictions. Consistency and transparency are critical as we work together with other jurisdictions on our parallel paths to achieve our GHG targets.

California's Approach to Addressing Climate Change

Integrated Systems

The State's climate goals require a comprehensive approach that integrates and builds upon multiple ongoing State efforts. As we address future mobility, we identify how existing efforts – such as the California Sustainable Freight Action Plan, Mobile Source Strategy, California Transportation Plan 2040, High-Speed

⁴⁰ CARB. 2016. California Greenhouse Gas Inventory - Forests and Other Lands. www.arb.ca.gov/cc/inventory/sectors/forest/forest.htm

Rail,⁴¹ urban planning, housing, and goals for enhancement of the natural environment – can complement each other while providing multiple environmental benefits, including air quality and climate benefits. The collective consideration of these efforts illuminates the synergies and conflicts between policies. For example, land disturbance due to increased renewables through utility scale wind and solar and transmission can release GHGs from soil and disturb grasslands and rangelands that have the potential to sequester carbon. Further, policies that support sustainable land use not only reduce vehicle miles traveled (VMT) and its related emissions, but may also avoid land disturbance that could result in GHG emissions or loss of sequestration potential in the natural environment. Identifying these types of trade-offs, and designing policies and implementation strategies to support goals across all sectors, will require ongoing efforts at the local, regional, and State level to ensure that sustainable action across both the built and natural environments help to achieve the State’s long-term climate goals.

Promoting Resilient Economic Growth

California’s strategic vision for achieving at least a 40 percent reduction in GHG emissions by 2030 is based on the principle that economic prosperity and environmental sustainability can be achieved together. Policies, strategies, plans and regulations to reduce GHG emissions help California businesses compete in a global economy and spur new investments, business creation, and jobs to support a clean energy economy. California’s portfolio-based climate strategy can achieve great success when accompanied by consistent and rigorous GHG monitoring and reporting, a robust public process, and an effective enforcement program for the few that attempt to evade rules. The transition to a low-carbon future can strengthen California’s economy and infrastructure and produce other important environmental benefits such as reductions in criteria pollutants and toxic air contaminants, especially in California’s most vulnerable communities.

Actions that are presented in this Scoping Plan provide economic opportunities for the future, but progress toward our goals is already evident today. For example, in 2015, California added more than 20,000 new jobs in the solar sector. This was more than half of the new jobs in this industry across the nation. Employment in the clean economy grew by 20 percent between 2002 and 2012, which included the period of economic recession around 2008.⁴² Shifting to clean, local, and efficient uses of energy reinvests our energy expenditures in our local economies and reduces risks to our statewide economy associated with exposure to volatile global and national oil and gas commodity prices. Indeed, a clean economy is a resilient economy.

Successfully driving economic transition will require cleaner and more efficient technologies, policies and incentives that recognize and reward innovation, and prioritizing low carbon investments. Enacting policies and incentives at multiple jurisdictional levels further ensures the advancement of land use and natural resource management objectives for GHG mitigation, climate adaptation, and other co-benefits. Intentional synergistic linkages between technological advances and resource stewardship can result in sustainable development. The development and implementation of Sustainable Communities Strategies (SCSs) pursuant to Senate Bill (SB) 375, which link transportation, housing, and climate policy, are designed to reduce per capita GHG emissions while improving air quality and expanding transportation and housing options. This Scoping Plan identifies additional ways, beyond SB 375, to promote the technologies and infrastructure required to meet our collective climate goals, while also presenting the vision for California’s continuing efforts to foster a sustainable, clean energy economy.

Increasing Carbon Sequestration in Natural and Working Lands

California’s natural and working lands make the State a global leader in agriculture, a U.S. leader in forest products, and a global biodiversity hotspot. These lands support clean air, wildlife and pollinator habitat, rural economies, and are critical components of California’s water infrastructure. Keeping these lands and waters intact and at high levels of ecological function (including resilient carbon sequestration) is necessary for the well-being and security of Californians in 2030, 2050, and beyond. Forests, rangelands, farms,

41 California’s High-Speed Rail is part of the International Union of Railways (UIC) and California signed the Railway Climate Responsibility Pledge, which was commended by the Secretary of the UN Framework Convention on Climate Change as part of achieving global 2050 targets.

42 California Business Alliance for a Clean Economy. 2015. Clean Energy and Climate Change Summary of Recent Analyses for California. clean-economy.org/wp-content/uploads/2015/01/Clean-Energy-Climate-Change-Analyses_January2015.pdf

wetlands, riparian areas, deserts, coastal areas, and the ocean store substantial carbon in biomass and soils. Natural and working lands are a key sector in the State's climate change strategy. Storing carbon in trees, other vegetation, soils, and aquatic sediment is an effective way to remove carbon dioxide from the atmosphere. This Scoping Plan describes policies and programs that prioritize protection and enhancement of California's landscapes, including urban landscapes, and identifies next steps to ensure management actions are taken to increase the sequestration potential of those resources. We cannot ignore the relationships between energy, transportation, and natural working lands sectors or the adverse impacts that climate change is having on the environment itself. We must consider important trade-offs in developing the State's climate strategy by understanding the near and long-term impacts of various policy scenarios and actions on our State and local communities.

Improving Public Health

The State's drive to improve air quality and promote community health and well-being as we address climate change remains a priority, as it has for almost 50 years. The State is committed to addressing public health issues, including addressing chronic and infectious diseases, promoting mental health, and protecting communities from exposure to harmful air pollutants and toxins. Several of the strategies included in this Plan were primarily developed to help California achieve federal and State ambient air quality standards for air pollutants with direct health impacts, but they will also deliver GHG reductions. Likewise, some climate strategies, such as GHG reduction measures that decrease diesel combustion from mobile sources, produce air quality co-benefits in the form of concurrent reductions in criteria pollutants and toxic air contaminants.

Climate change itself is already affecting the health of our communities and is exacerbating existing health inequities. Those facing the greatest health burdens include low-income individuals and households, the very young and the very old, communities of color, and those who have been marginalized or discriminated against based on gender or race/ethnicity.⁴³ Economic factors, such as income, poverty, and wealth, are among the strongest determinants of health. Addressing climate change presents an important opportunity to improve public health for all of California's residents and to further our work toward making our State the healthiest in the nation.

The major provisions of AB 617 (C. Garcia, 2017), to be completed by 2020, will ensure that as the State seeks to advance climate policy to meet the 2030 target, we will also act locally to improve neighborhood air quality. AB 617 requires strengthening and expanding community level air monitoring; expediting equipment retrofits at large industrial sources that are located in areas that are in nonattainment for the federal and State ambient air quality standards; requiring development of a statewide strategy to further reduce criteria pollutants and toxic air contaminants in communities faced with high cumulative exposure levels; and local air district-developed community emissions reductions plans that identify emissions reductions targets, measures, implementation schedules, and enforcement plans for these affected communities. By identifying and addressing the disproportionate impacts felt today and by planning, designing, and implementing actions for a sustainable future that considers both climate and air quality objectives, we can be part of the solution to make public health inequities an issue of the past.

Environmental Justice

Fair and equitable climate action requires addressing the inequities that create and intensify community vulnerabilities. The capacity for resilience in the face of climate change is driven by living conditions and the forces that shape them. These include, but are not limited to, access to services such as health care, healthy foods, air and water, and safe spaces for physical activity; income; education; housing; transportation; environmental quality; and good health status. Strategies to alleviate poverty, increase access to economic opportunities, improve living conditions, and reduce health and social inequities will result in more climate-resilient communities. The transition to a low carbon California economy provides an opportunity to not only reduce GHG emissions, but also to reduce emissions of criteria pollutants and air toxins, and to create a healthier environment for all of California's residents, especially those living in the State's most disadvantaged communities. Policies designed to facilitate this transition and state-wide, regional, and local reductions,

⁴³ California Department of Public Health (CDPH). 2015. The Portrait of Promise: The California Statewide Draft Plan to Promote Health and Mental Health Equity. A Report to the Legislature and the People of California by the Office of Health Equity. Sacramento, CA: California Department of Public Health, Office of Health Equity.

must also be appropriately tailored to address the unique characteristics of economically distressed communities throughout the State's diverse geographic regions, including both rural and highly-urbanized areas. Equity considerations must likewise be part of the deliberate and thoughtful process in the design and implementation of all policies and measures included in the Scoping Plan. And CARB must ensure that its ongoing engagement with environmental justice communities will continue beyond the development of the Scoping Plan and be included in all aspects of its various air pollution programs. Additional detail on CARB's efforts to achieve these goals is provided in Chapter 5.

It is critical that communities of color, low-income communities, or both, receive the benefits of the cleaner economy growing in California, including its environmental and economic benefits. Currently, low-income customers enrolled in the California Alternate Rates for Energy (CARE) Program or the Family Electric Rate Assistance (FERA) Program are also eligible to receive a rebate under the California Climate Credit, or a credit on residential and small business electricity bills resulting from the sale of allowances received by investor-owned utilities as part of the Cap-and-Trade Program. SB 1018 (Committee on Budget and Fiscal Review, Chapter 39, Statutes of 2012) and other implementing legislation requires that Cap-and-Trade Program auction monies deposited into the Greenhouse Gas Reduction Fund (GGRF) be used to further the purposes of AB 32 and facilitate reduction of GHG emissions. Investments made with these funds not only reduce GHG emissions, but also provide other environmental, health, and economic benefits including, fostering job creation by promoting in-state GHG emissions reduction projects carried out by California workers and businesses.

Further, SB 535 (De Leon, Chapter 830, Statutes of 2012) and AB 1550 (Gomez, Chapter 369, Statutes of 2016) direct State and local agencies to make significant investments using GGRF monies to assist California's most vulnerable communities. Under SB 535 (de León, Chapter 830, Statutes of 2012), a minimum of 25 percent of the total investments were required to benefit disadvantaged communities; of that, a minimum of 10 percent were required to be located within and provide benefits to those communities. Based on cumulative data reported by agencies as of March 2016, the State is exceeding these targets. Indeed, 50 percent of the \$1.2 billion dollars spent on California Climate Investments projects provided benefits to disadvantaged communities; and 34 percent of this funding was used on projects located directly in disadvantaged communities.⁴⁴

Environmental Justice Advisory Committee

AB 32 calls for CARB to convene an Environmental Justice Advisory Committee (EJAC), to advise the Board in developing the Scoping Plan, and any other pertinent matter in implementing AB 32. It requires that the Committee be comprised of representatives from communities in the State with the most significant exposure to air pollution, including, but not limited to, communities with minority populations or low-income

ENVIRONMENTAL JUSTICE ADVISORY COMMITTEE

Martha Dina Argüello	Physicians for Social Responsibility	Los Angeles
Colin Bailey	The Environmental Justice Coalition for Water	Sacramento
Gisele Fong	End Oil	Los Angeles
Tom Frantz	Association of Irrigated Residents	Central Valley
Katie Valenzuela García (Served until May 2017)	Oak Park Neighborhood Association	Sacramento
Sekita Grant (Served until June 2017)	The Greenlining Institute	Statewide
Kevin Hamilton	Central California Asthma Collaborative	Central Valley
Rey León	Valley LEAP	Central Valley
Luis Olmedo	Comité Civico Del Valle	Salton Sea Region
Kemba Shakur	Urban Releaf	Bay Area
Mari Rose Taruc	Asian Pacific Environmental Network	Bay Area
Eleanor Torres	The Incredible Edible Community Garden	Inland Empire
Monica Wilson	Global Alliance for Incinerator Alternatives	Bay Area

44 www.arb.ca.gov/cc/capandtrade/auctionproceeds/ci_annual_report_2017.pdf

populations, or both. CARB consulted 13 environmental justice and disadvantaged community representatives for the 2017 Scoping Plan process, starting with the first Committee meeting in December 2015. In February and April 2017, members of the California Air Resources Board held joint public meetings with the EJAC to discuss options for addressing environmental justice and disadvantaged community concerns in the Scoping Plan. The full schedule of Committee meetings and meeting materials is available on CARB's website.⁴⁵

Starting in July 2016, the Committee hosted a robust community engagement process, conducting 19 community meetings throughout the State. To enhance this community engagement, CARB staff coordinated with staff from local government agencies and sister State agencies. At the community meetings, staff from State and local agencies participated in extensive, topic-specific "world café" discussions with local groups and individuals. The extensive dialogue between the EJAC, State agencies, and local agencies provided community residents the opportunity to share concerns and provide input on ways California can meet its 2030 GHG target while addressing a number of environmental and equity issues.

Environmental Justice Advisory Committee Recommendations

The Committee's recommendations for the Scoping Plan were informed by comments received at community meetings described above and Committee member expertise. Recommendations were provided for the sector focus areas, overarching environmental justice policy, and California Climate Investments. The Committee also sorted their recommendations into five themes: partnership with environmental justice communities, equity, economic opportunity, coordination, and long-term vision. Finally, the Committee provided direction that their recommendations are intended "to be read and implemented holistically and not independently of each other." The EJAC's recommendations, in their entirety, are included in Appendix A and available at www.arb.ca.gov/cc/ejac/meetings/04262017/ejac-sp-recommendations033017.pdf.

The Committee's overarching recommendations for partnership with environmental justice communities, equity, coordination, economic opportunity, and long-term vision include the following recommendations:

- Encourage long-term community engagement, a culture shift in California, and neighborhood-level solutions to promote the implementation of the State's climate plans, using strategies identified by the Committee.
- Improve the balance of reducing GHGs and compliance costs with other AB 32 goals of improving air quality in environmental justice communities while maximizing benefits for all Californians.
- Consider public health impacts and equity when examining issues in any sector and have CARB conduct an equity analysis on the Scoping Plan and each sector, with guidance from the Committee.
- Develop metrics to ensure actions are meeting targets and develop contingency plans for mitigation and adjustment if emissions increases occur as programs are implemented.
- Develop a statewide community-based air monitoring network to support regulatory efforts and monitor neighborhood scale pollution in disadvantaged communities.
- Coordinate strategies between State, federal, and local agencies for strong, enforceable, evidence-based policies to prevent and address sprawl with equity at the center.
- Maximize the accessibility of safe jobs, incentives, and economic benefits for Californians and the development of a just transition for workers and communities in and around polluting industries.
- Prioritize improving air quality in environmental justice communities and analyze scenarios at a neighborhood scale for all California communities.
- Ensure that AB 32 economic reviewers come from various areas around the State to represent insights on economic challenges and opportunities from those regions.
- Do not limit the Scoping Plan to examining interventions and impacts until 2030, or even 2050. Plan and analyze on a longer-term scale to prevent short-sighted mistakes and reach the long-term vision, as actions today and for the next 30 years will have impacts for seven generations.
- The Scoping Plan must prioritize GHG reductions and investments in California environmental justice communities first, before other California communities; and the innovation of new technologies or strategies to reach even deeper emissions cuts, whenever possible.
- Convene the Committee beyond the Scoping Plan development process.

The Committee's key Energy sector recommendations include:

- Developing aggressive energy goals toward 100 percent renewable energy by 2030, including a vision for a clean energy economy, and prioritizing actions in disadvantaged communities.

⁴⁵ www.arb.ca.gov/cc/ejac/ejac.htm

- Setting goals for green buildings.
- Enforcing GHG reduction targets for existing buildings, and providing upgrades that enable buildings to use renewable energy technologies and water capture.
- Prioritizing and supporting community-owned technologies, such as community-owned solar, for environmental justice communities.

Key Water sector recommendations include:

- Encouraging water conservation and recycling.
- Prioritizing safe drinking water for all.

The Committee's key Industry sector recommendations include:

- Prioritizing direct emissions reductions in environmental justice communities.
- Replacing the Cap-and-Trade Program with a carbon tax or fee and dividend program.
- Eliminating offsets and the allocation of free allowances if the Cap-and-Trade Program continues.
- Analyze where GHG emissions are increasing and identify strategies to prevent and reduce such emissions in environmental justice communities.
- Committing to reductions in petroleum use.

The Committee's key Transportation sector recommendations include:

- Increasing access to affordable, reliable, clean, and safe mobility options in disadvantaged communities.
- Community-engaged land use planning.
- Maximizing electrification.
- Restricting sprawl and examining transportation regionally.
- Considering the development of green transportation hubs that integrate urban greening with transportation options and implement the recommendations of the SB 350 studies.

The Committee's key Natural and Working Lands, Agriculture, and Waste sector recommendations include:

- Reducing waste and mandating that local jurisdictions manage the waste they create.
- Returning carbon to the soil.
- Not burning biomass or considering it a renewable resource.
- Supporting healthy soils as a critical element to land and waste management.
- Integrating urban forestry within local communities.
- Exploring ways to allow and streamline the process for cultural and prescribed burning for land management and to prevent large-scale wildfires.
- Including an annual reduction of 5 million metric tons of CO₂e from natural and working lands.

The Committee's recommendations for California Climate Investments include:

- Ensuring near-term technologies do not adversely impact communities and long-term investments move toward zero emissions.
- Requiring GGRF projects to be transformative for disadvantaged communities as defined by each community.
- Eliminating funding for AB 32 regulated entities.
- Providing technical assistance to environmental justice communities so they can better access funding and resources.
- Prioritizing projects identified by communities and ensuring all applicants have policies to protect against displacement or gentrification.

In April 2017, EJAC members provided a refined list of priority changes for the Scoping Plan from the full list of EJAC recommendations. CARB staff responded to each priority recommendation, describing additions to the Scoping Plan or suggested next steps for recommendations beyond the level of detail in the Plan. Appendix A includes the Priority EJAC Recommendations with CARB Responses and full list of EJAC Recommendations.

More information about the Committee and its recommendations on the previous Scoping Plans and this Scoping Plan is located at: www.arb.ca.gov/ejac.

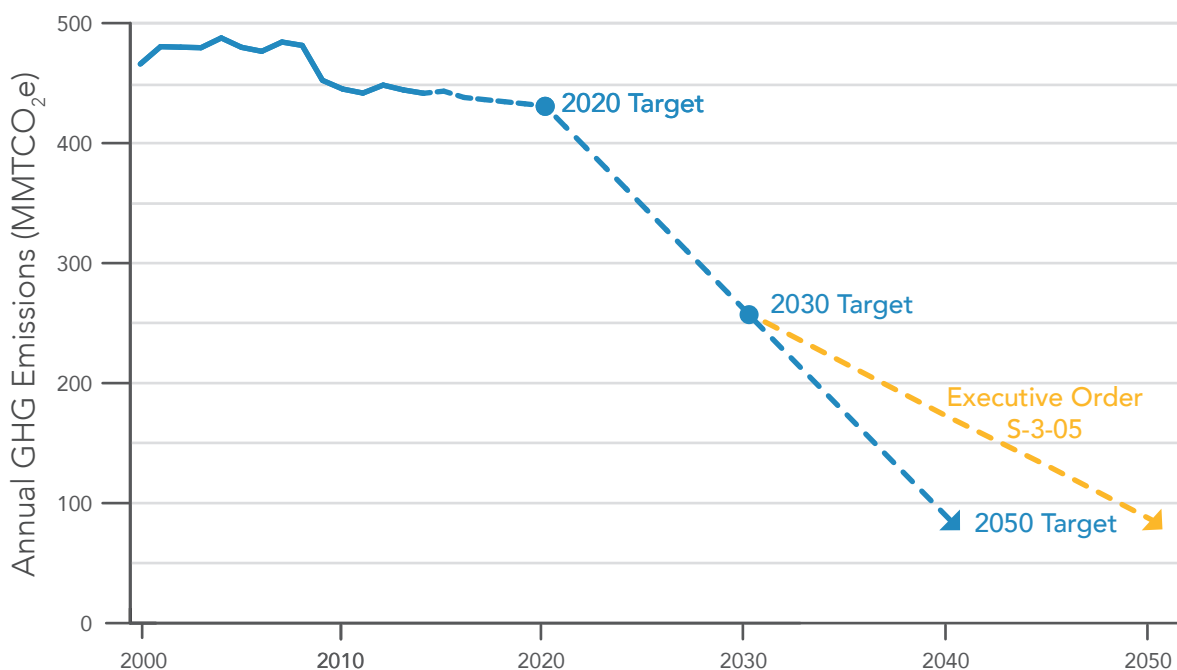
Setting the Path to 2050

The State's 2020 and 2030 targets have not been set in isolation. They represent benchmarks, consistent with prevailing climate science, charting an appropriate trajectory forward that is in-line with California's role in stabilizing global warming below dangerous thresholds. As we consider efforts to reduce emissions to meet the State's near-term requirements, we must do so with an eye toward reductions needed beyond 2030, as well. The Paris Agreement – which calls for limiting global warming to well below 2 degrees Celsius and aiming to limit it below a 1.5 degrees Celsius – frames our path forward.

While the Scoping Plan charts the path to achieving the 2030 GHG emissions reduction target, we also need momentum to propel us to the 2050 statewide GHG target (80 percent below 1990 levels). In developing this Scoping Plan, we considered what policies are needed to meet our mid-term and long-term goals. For example, though Zero Net Carbon Buildings are not feasible at this time and more work needs to be done in this area, they will be necessary to achieve the 2050 target. To that end, work must begin now to review and evaluate research in this area, establish a planning horizon for targets, and identify implementation mechanisms. Concurrently, we must consider and implement policies that not only deliver critical reductions in 2030 and continue to help support the State's long-term climate objectives, but that also deliver other health, environmental and economic benefits. We should not just be planning to put 1.5 million ZEVs on the road by 2025 or 4.2 million on the road by 2030 – but rather, we should be comprehensively facilitating the market-wide transition to electric drive that we need to see materialize as soon as possible. This means that we need to be working towards making all fuels low carbon as quickly as possible, even as we incrementally ramp up volume requirements through the Low Carbon Fuel Standard. And it means that we need to support the broad array of actions and strategies identified in Chapter 4, and new ones that may emerge – to keep us on track to achieve deeper GHG reductions to protect the environment and our way of life. As with all investments, the approach taken must balance risk, reward, longevity, and timing.

Figure 5 illustrates the potential GHG reductions that are possible by making consistent progress between 2020 and 2050, versus an approach that begins with the 2030 target and then makes progress toward the 2050 level included in Executive Order S-3-05. Depending on our success in achieving the 2030 target, taking a consistent approach may be possible. It would achieve the 2050 target earlier, and together with similar actions globally, would have a greater chance of preventing global warming of 2°C. The strategy for achieving the 2050 target should leave open the possibility for both paths. Note that Figure 5 does not include emissions or sequestration potential from the natural and working lands sector or black carbon.

FIGURE 5: PLOTTING CALIFORNIA'S PATH FORWARD



Intergovernmental Collaboration

Federal, state, Tribal, and local action can be complementary. We have seen federal action through the Clean Air Act, regulations for GHG emissions from passenger cars and trucks, development of the Clean Power Plan to limit GHGs from power plants, and the advancement of methane rules for oil and gas production. We have also seen recent federal efforts to delay or reverse some of these actions. As we have done in the past, California, working with other climate leaders, can take steps to advance more ambitious federal action and protect the ability of states to move forward to address climate change. Both collaboration and advocacy will mark the road ahead. However, to the extent that California cannot implement policies or measures included in the Scoping Plan because of the lack of federal action, we will develop alternative measures to achieve the reductions from the same sectors to ensure we meet our GHG reduction targets.

Regional, Tribal, and local governments and agencies are critical leaders in reducing emissions through actions that reduce demand for electricity, transportation fuels, and natural gas, and improved natural and working lands management. Many local governments already employ efforts to reduce GHG emissions beyond those required by the State. For example, many cities and counties improve their municipal operations by upgrading vehicle fleets, retrofitting government buildings and streetlights, purchasing greener products, and implementing waste-reduction policies. In addition, they may adopt more sustainable codes, standards, and general plan improvements to reduce their community's footprints and emissions. Many Tribes within and outside of California have engaged in consultations with CARB to develop robust carbon offset projects under California's Cap-and-Trade Program, in particular forest projects. In fact, Tribal forest projects represent a significant percentage of offset credits issued under the Program. These consultations and carbon sequestration projects are in addition to other Tribal climate-related efforts. The State will provide a supportive framework to advance these and other local efforts, while also recognizing the need to build on, and export, this success to other regional, Tribal, and local governments throughout California and beyond.

Local actions are critical for implementation of California's ambitious climate agenda. State policies, programs, and actions—such as many of those identified throughout this Scoping Plan—can help to support, incentivize, and accelerate local actions to achieve mutual goals for more sustainable and resilient communities. Local municipal code changes, zoning changes, or policy directions that apply broadly to the community within the general plan or climate action plan area can promote the deployment of renewable, zero emission, and low carbon technologies such as zero net energy buildings, renewable fuel production facilities, and zero emission charging stations. Local decision-making has an especially important role in achieving reductions of GHG emissions generated from transportation. Over the last 60 years, development patterns have led to sprawling suburban neighborhoods, a vast highway system, growth in automobile ownership, and under-prioritization of infrastructure for public transit and active transportation. Local decisions about these policies today can establish a more sustainable built environment for the future.

International Efforts

California is not alone in its efforts to address climate change at the international level to reduce global GHG emissions. The agreement reached in Paris by the 2015 Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at keeping the global temperature rise below 2°C, is spurring worldwide action to reduce GHGs and support decarbonization across the global economy. In recent years, subnational governments have emerged to take on a prominent role. With the establishment of the Under 2 Memorandum of Understanding (MOU),^{46,47} the Governors' Climate and Forests Task Force,⁴⁸ and the Western Climate Initiative,⁴⁹ among other partnership initiatives, subnational jurisdictions from the around the world are collaborating and leading on how best to address climate change.

46 Under 2 MOU website: under2mou.org/

47 One of the Brown Administration's priorities is to highlight California's climate leadership on the subnational level, and to ensure that subnational activity is recognized at the international level. In the year preceding the Paris negotiations, the Governor's Office recruited subnational jurisdictions to sign onto the Memorandum of Understanding on Subnational Global Climate Leadership (Under 2 MOU), which brings together states and regions willing to commit to reducing their GHG emissions by 80 to 95 percent, or to limit emissions to 2 metric tons CO₂-equivalent per capita, by 2050. The governor led a California delegation to the Paris negotiations to highlight our successful climate programs and to champion subnational action and international cooperation on meeting the challenge of reducing GHG emissions. As of October 2017, 188 jurisdictions representing more than 1.2 billion people and more than one-third of the global economy had joined California in the Under 2 MOU.

48 Governors' Climate and Forests Task Force website: www.gcftaskforce.org/

49 Western Climate Initiative website: www.wci-inc.org/

From its inception, AB 32 recognized the importance of California's climate leadership and engagement with other jurisdictions, and directed CARB to consult with the federal government and other nations to identify the most effective strategies and methods to reduce GHGs, manage GHG control programs, and facilitate the development of integrated and cost-effective regional, national, and international GHG reduction programs. California undertook a two-pronged approach: first, we assessed our State-specific circumstances to develop measures that would apply specifically in California; and second, we assessed which measures might lend themselves, through careful design and collaboration with other interested jurisdictions, toward linked or collaborative GHG reduction programs. Under the Clean Air Act, California has a special role as an innovator and leader in the area of motor vehicle emission regulations, which allows our State to adopt motor vehicle emission standards that are stricter than federal requirements. Partners around the country and the world emulate these motor vehicle standards, leading to widespread health benefits. Similarly, by enacting a comprehensive climate strategy that appeals to national and international partners, California can help lead the world in tackling climate change.

Today, the State's Cap-and-Trade Program is linked with Québec's program and scheduled to link with Ontario's emissions trading system on January 1, 2018. Low carbon fuel mandates similar to California's LCFS have been adopted by the United States Environmental Protection Agency (U.S. EPA) and by other jurisdictions including Oregon, British Columbia, the European Union, and the United Kingdom. Over two-dozen states have a renewables portfolio standard. California is a member of the Pacific Coast Collaborative with British Columbia, Oregon, and Washington, who collaborate on issues such as energy and sustainable resource management, among others.⁵⁰ California continues to discuss carbon pricing through a cap-and-trade program with international delegations. We have seen design features of the State's Cap-and-Trade Program incorporated into other emerging and existing programs, such as the European Union Emissions Trading System, the Regional Greenhouse Gas Initiative, China's emerging national trading program, and Mexico's emerging pilot emission trading program.

Recognizing the need to address the substantial GHG emissions caused by the deforestation and degradation of tropical and other forests, California worked with a group of subnational governments to form the Governors' Climate and Forests Task Force (GCF) in 2008.⁵¹ The GCF is currently comprised of 38 different subnational jurisdictions—including states and provinces in Brazil, Colombia, Ecuador, Indonesia, Ivory Coast, Mexico, Nigeria, Peru, Spain, and the United States—that are contemplating or enacting programs for low-emissions rural development and reduced emissions from deforestation and land use. GCF members continue to engage in discussions to share information and experiences about the design of such programs and how the programs could potentially interact with carbon markets. Ongoing engagement between California and its GCF partners, as well as ongoing discussions with other stakeholders, continues to provide lessons on how such programs could complement California's climate programs.⁵²

Further, California's High-Speed Rail is part of the International Union of Railways (UIC), and California has signed the Railway Climate Responsibility Pledge, which was commended by the Secretary of the UNFCCC as part of achieving the global 2050 targets. This initiative is to demonstrate that rail transport is part of the solution for sustainable and carbon free mobility.

California will continue to engage in multi-lateral forums that develop the policy foundation and technical infrastructure for GHG regulations in multiple jurisdictions through entities such as the International Carbon Action Partnership (ICAP), established by California and other partners in 2007. Members of the ICAP that have already implemented or are actively pursuing market-based GHG programs⁵³ share experiences and knowledge. California also participates in the Partnership for Market Readiness (PMR), a multilateral World Bank initiative that brings together more than 30 developed and developing countries to share experiences and build capacity for climate change mitigation efforts, particularly those implemented using market instruments.⁵⁴ In November 2014, CARB became a Technical Partner of the PMR, and CARB staff members have provided technical information on the design and implementation of the Cap-and-Trade Program at several PMR meetings.

50 Pacific Coast Collaborative website: pacificcoastcollaborative.org/

51 Governors' Climate and Forests Task Force Website: www.gcftaskforce.org/

52 Continued collaboration on efforts to reduce emissions from tropical deforestation and to evaluate sector-based offset programs, such as the jurisdictional program in Acre, Brazil, further demonstrates California's ongoing climate leadership and fosters partnerships on mutually beneficial low emissions development initiatives, including measures to encourage sustainable supply chain efforts by public and private entities.

53 International Carbon Action Partnership website: icapcarbonaction.com/

54 Partnership for Market Readiness website: www.thepmr.org/

Many foreign jurisdictions seek out California's expertise because of our history of success in addressing air pollution and climate change. California also benefits from these interactions. Expanding global action to fight air pollution and climate change expands markets for clean technology. This can bolster business for companies in California developing clean energy products and services and help to bring down the cost of those products globally and in California. Additionally, innovative policies and lessons learned from our partners' jurisdictions can help to inform future climate policies in California.

Governor Brown's focus on subnational collaborations on climate change and air quality has strengthened and deepened California's existing international relationships and forged new ones. These relationships are a critical component of reducing emissions of GHGs and other pollutants worldwide. As we move forward, CARB and other State agencies will continue to communicate and collaborate with international partners to find the most cost-effective ways to improve air quality, fight climate change, and share California's experience and expertise in reducing air pollution and GHGs while growing a strong economy. To highlight the State's resolve and support of other governments committed to action and tackling the threat of the global warming, on July 6, 2017, Governor Brown announced a major initiative to host world leaders at a Global Climate Action Summit planned for September 2018 in San Francisco.

Chapter 2

THE SCOPING PLAN SCENARIO

This chapter describes the State strategy for meeting the 2030 GHG target (also called the Scoping Plan Scenario), along with a short description of the four alternative scenarios, which were evaluated but ultimately rejected when compared against statutory and policy criteria and priorities that the State's comprehensive climate action must deliver. All scenarios are set against the business-as-usual (BAU or Reference Scenario) scenario—what would GHG emissions look like if we did nothing beyond the existing policies that are required and already in place to achieve the 2020 limit. BAU includes the existing renewables requirements, advanced clean cars, the 10 percent reduction in carbon intensity Low Carbon Fuel Standard, and the SB 375 program for sustainable communities, among others. However, it does not include a range of new policies or measures that have been developed or put into statute over the past two years.

The Reference Scenario (BAU) shows continuing, but modest, reductions followed by a later rise of GHG emissions as the economy and population grow. The comprehensive analysis of all five alternatives indicates that the Scoping Plan Scenario—continuing the Cap-and-Trade Program—is the best choice to achieve the State's climate and clean air goals. It also protects public health, provides a solid foundation for continued economic growth, and supports California's quality of life.

All of the alternative scenarios briefly described in this chapter are the product of the Scoping Plan development process and were informed by public input, including that from EJAC, as well as Board and legislative direction over the course of two years. The scenarios all include a range of additional measures developed or required by legislation over the past two years with 2030 as their target date and include: extending the LCFS to an 18 percent reduction in carbon intensity beyond 2020, and the requirements of SB 350 to increase renewables to 50 percent and to double energy efficiency savings. They also all include the Mobile Source Strategy targets for more zero emission vehicles and much cleaner trucks and transit, the Sustainable Freight Action Plan to improve freight efficiency and transition to zero emission freight handling technologies, and the requirements under SB 1383 to reduce anthropogenic black carbon 50 percent and hydrofluorocarbon and methane emissions by 40 percent below 2013 levels by 2030. The recent adoption of AB 398 into State law on July 25, 2017, clarifies the role of the Cap-and-Trade Program through December 31, 2030.

Work is still underway on how to quantify the GHG emissions within the natural and working lands sector. As such, the analyses in this chapter do not include any estimates from this sector. Additional information on the current efforts to better understand GHG emissions fluxes and model the actions needed to support the goal of net carbon sequestration in natural and working lands can be found in Chapter 4. Even absent quantification data, the importance of this sector in achieving the State's climate goals should be considered in conjunction with any efforts to reduce GHG emissions in the energy and industrial sectors.

During the development of the Scoping Plan, stakeholders suggested alternative scenarios to achieve the 2030 target. While countless scenarios could potentially be developed and evaluated, the four below were considered, as they were most often included in comments by stakeholders and they bracket the range of potential scenarios. Several of these alternative scenarios were also evaluated in the Initial AB 32 Scoping Plan in 2008 (All Regulations, Carbon Tax).⁵⁵ Since the adoption of the Initial AB 32 Scoping Plan, some of the alternative scenarios have been implemented or contemplated by other jurisdictions, which has helped in the analysis and the development of this Scoping Plan. This section provides a brief description of the alternatives. A full description of the alternatives and staff's AB 197 and policy analyses are included in Appendix G.

⁵⁵ CARB. 2009. Initial AB 32 Climate Change Scoping Plan Document.
www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

Scoping Plan Scenario: Ongoing and statutorily required programs and continuing the Cap-and-Trade Program. This scenario was modified from the January 2017 Proposed Scoping Plan to reflect AB 398, including removal of the 20 percent refinery measure.

Alternative 1: No Cap-and-Trade. Includes additional activities in a wide variety of sectors, such as specific required reductions for all large GHG sources, and more extensive requirements for renewable energy. Industrial sources would be regulated through command and control strategies.

Alternative 2: Carbon Tax. A carbon tax to put a price, but not limit, on carbon, instead of the Cap-and-Trade Program.

Alternative 3: All Cap-and-Trade. This alternative is the same as the Scoping Plan Scenario, while maintaining the LCFS at a 10 percent reduction in carbon intensity past 2020.

Alternative 4: Cap-and-Tax. This would place a declining cap on individual industrial facilities, and individual natural gas and fuel suppliers, while also requiring them to pay a tax on each metric ton of GHGs emitted.

Since the statutory direction on meeting a 2030 GHG target is clear, the issue of certainty of reductions is paramount. These alternatives vary greatly as to the certainty of meeting the target. The declining mass emissions cap under a cap-and-trade program provides certain and measurable reductions over time; a carbon tax, meanwhile, establishes some carbon price certainty, but does not provide an assurance on reductions and instead assumes that some degree of reductions will occur if costs are high enough to alter behavior.

There are also other considerations: to what extent does an alternative meet the target, but also deliver clean air benefits, prioritize reductions at large stationary sources, and allow for continued investment in disadvantaged communities? What is the cost of an alternative and what will be the impact on California consumers? Does an alternative allow for California to link with other jurisdictions, and support the Clean Power Plan⁵⁶ and other federal and international climate programs? Does an alternative provide for flexibility for regulated entities, and a cost-effective approach to reduce greenhouse gases?

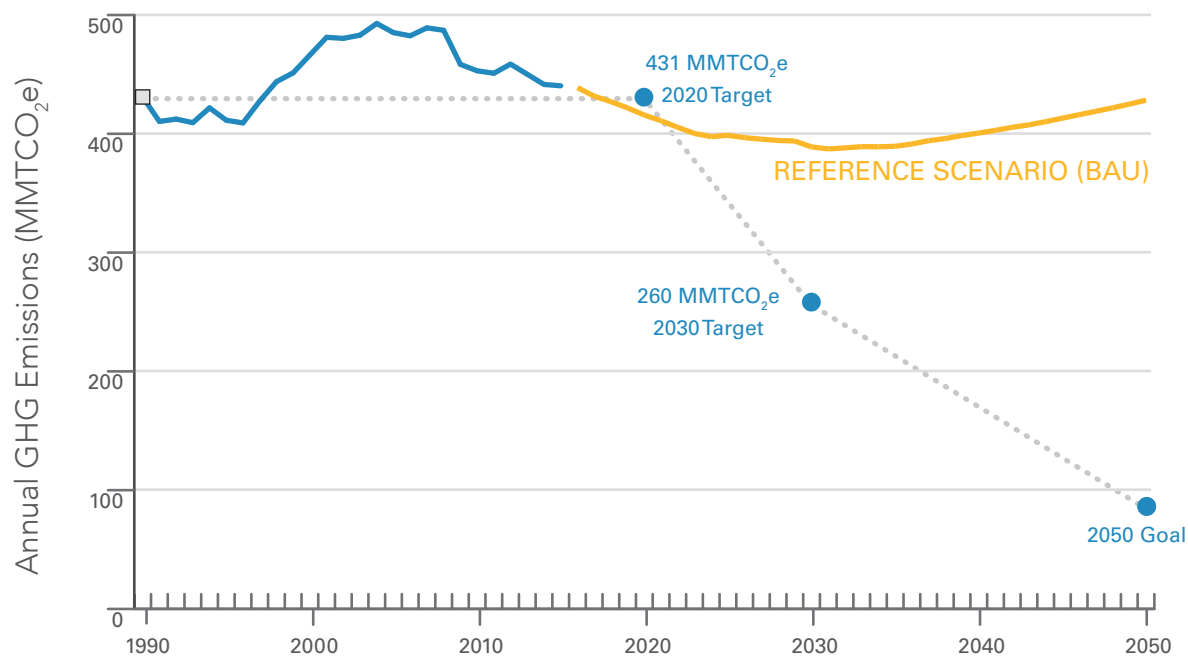
The Scoping Plan Scenario provides a portfolio of policies and measures that balances this combination of objectives, including the highest certainty to achieve the 2030 target, while protecting the California economy and consumers. A more detailed analyses of the alternatives is provided in Appendix G.

Scoping Plan Scenario

The development of the Scoping Plan began by first modeling a Reference Scenario (BAU). The Reference Scenario is the forecasted statewide GHG emissions through 2030 with existing policies and programs, but without any further action to reduce GHGs. Figure 6 provides the modeling results for a Reference Scenario for this Scoping Plan. The graph shows the State is expected to reduce emissions below the 2020 statewide GHG target, but additional effort will be needed to maintain and continue GHG reductions to meet the mid- (2030) and long-term (2050) targets. Figure 6 depicts a linear, straight-line path to the 2030 target. It should be noted that in any year, GHG emissions may be higher or lower than the straight line. That is to be expected as periods of economic recession or increased economic activity, annual variations in hydropower, and many other factors may influence a single or several years of GHG emissions in the State. CARB's annual GHG reporting and inventory will provide data on progress towards achieving the 2030 target. More details about the modeling for the Reference Scenario can be found in Appendix D.

⁵⁶ Although the Clean Power Plan is being challenged in legal and administrative processes, its requirements reflect U.S. EPA's statutory obligation to regulate greenhouse gases from the power sector. Thus it, and other federal programs, are a key consideration for Scoping Plan development.

FIGURE 6: 2017 SCOPING PLAN REFERENCE SCENARIO



The Scoping Plan Scenario is summarized in Table 1. As shown in the table, most of the measures are identified as “known commitments” (marked with “*”), meaning that they are existing programs or required by statute. These commitments are not part of the Reference Scenario (BAU) in Figure 6 since their passage and implementation is related to meeting the Governor’s climate pillars, the 2030 climate target, or other long-term climate and air quality objectives. In addition to the known commitments, the Scoping Plan Scenario includes a post-2020 Cap-and-Trade Program.

TABLE 1: SCOPING PLAN SCENARIO

Policy	Primary Objective	Highlights	Implementation Time Frame
SB 350 ^{57*}	Reduce GHG emissions in the electricity sector through the implementation of the 50 percent RPS, doubling of energy savings, and other actions as appropriate to achieve GHG emissions reductions planning targets in the Integrated Resource Plan (IRP) process.	<ul style="list-style-type: none"> • Load-serving entities file plans to achieve GHG emissions reductions planning targets while ensuring reliability and meeting the State's other policy goals cost-effectively. • 50 percent RPS. • Doubling of energy efficiency savings in natural gas and electricity end uses statewide. 	2030
Low Carbon Fuel Standard (LCFS)*	Transition to cleaner/less-polluting fuels that have a lower carbon footprint.	<ul style="list-style-type: none"> • At least 18 percent reduction in carbon intensity, as included in the Mobile Source Strategy. 	2030
Mobile Source Strategy (Cleaner Technology and Fuels [CTF] Scenario) ^{58*}	Reduce GHGs and other pollutants from the transportation sector through transition to zero-emission and low-emission vehicles, cleaner transit systems and reduction of vehicle miles traveled.	<ul style="list-style-type: none"> • 1.5 million zero emission vehicles (ZEV), including plug-in hybrid electric, battery-electric, and hydrogen fuel cell vehicles by 2025 and 4.2 million ZEVs by 2030. • Continue ramp up of GHG stringency for all light-duty vehicles beyond 2025. • Reductions in GHGs from medium-duty and heavy-duty vehicles via the Phase 2 Medium and Heavy-Duty GHG Standards. • Innovative Clean Transit: Transition to a suite of innovative clean transit options. Assumed 20 percent of new urban buses purchased beginning in 2018 will be zero emission buses with the penetration of zero-emission technology ramped up to 100 percent of new bus sales in 2030. Also, new natural gas buses, starting in 2018, and diesel buses, starting in 2020, meet the optional heavy-duty low-NO_x standard. • Last Mile Delivery: New regulation that would result in the use of low NO_x or cleaner engines and the deployment of increasing numbers of zero-emission trucks primarily for class 3-7 last mile delivery trucks in California. This measure assumes ZEVs comprise 2.5 percent of new Class 3–7 truck sales in local fleets starting in 2020, increasing to 10 percent in 2025. • Reduction in vehicle miles traveled (VMT), to be achieved in part by continued implementation of SB 375 and regional Sustainable Community Strategies; forthcoming statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy, but included in the document "Potential VMT Reduction Strategies for Discussion" in Appendix C.⁵⁹ 	Various
SB 1383*	Approve and Implement Short-Lived Climate Pollutant strategy ⁶⁰ to reduce highly potent GHGs	<ul style="list-style-type: none"> • 40 percent reduction in methane and hydrofluorocarbon (HFC) emissions below 2013 levels by 2030. • 50 percent reduction in anthropogenic black carbon emissions below 2013 levels by 2030. 	2030
California Sustainable Freight Action Plan ^{61*}	Improve freight efficiency, transition to zero emission technologies, and increase competitiveness of California's freight system.	<ul style="list-style-type: none"> • Improve freight system efficiency by 25 percent by 2030. • Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize both zero and near-zero emission freight vehicles and equipment powered by renewable energy by 2030. 	2030
Post-2020 Cap-and-Trade Program	Reduce GHGs across largest GHG emissions sources	<ul style="list-style-type: none"> • Continue the existing Cap-and-Trade Program with declining caps to ensure the State's 2030 target is achieved. 	
* These measures and policies are referred to as "known commitments."			

57 SB 350 Clean Energy and Pollution Reduction Act of 2015 (De León, Chapter 547, Statutes of 2015). [leginfo.legislature.ca.gov/faces/billNavClient.xhtml?billid=201520160SB350](https://leginfo.ca.gov/faces/billNavClient.xhtml?billid=201520160SB350) This policy also includes increased demand response and PV.

58 CARB. 2016. 2016 Mobile Source Strategy. www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.pdf

59 CARB. Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT)--for Discussion. www.arb.ca.gov/cc/scopingplan/meetings/091316/Potential%20VMT%20Measures%20For%20Discussion_9.13.16.pdf

60 CARB. 2016. Reducing Short-Lived Climate Pollutants in California. www.arb.ca.gov/cc/shortlived/shortlived.htm

61 State of California. California Sustainable Freight Action Plan website. www.casustainablefreight.org/

Table 2 summarizes the results of the modeling for the Reference Scenario and known commitments. Per SB 32, the 2030 limit is 260 MMTCO₂e. That is a limit on total GHG emissions in a single year. At approximately 389 MMTCO₂e, the Reference Scenario is expected to exceed the 2030 limit by about 129 MMTCO₂e.

Table 2 also compares the Reference Scenario 2030 emissions estimate of 389 MMTCO₂e to the 2030 target of 260 MMTCO₂e and the level of 2030 emissions with the known commitments, estimated to be 320 MMTCO₂e. And, in the context of a linear path to achieve the 2030 target, there is also a need to achieve cumulative emissions reductions of 621 MMTCO₂e from 2021 to 2030 to reach the 2030 limit. While there is no statutory limit on cumulative emissions, the analysis considers and presents some results in cumulative form for several reasons. It should be recognized that policies and measures may perform differently over time. For example, in early years, a policy or measure may be slow to be deployed, but over time it has greater impact. If you were to look at its performance in 2021 versus 2030, you would see that it may not seem important and may not deliver significant reductions in the early years, but is critical for later years as it results in greater reductions over time. Further, once GHGs are emitted into the atmosphere, they can have long lifetimes that contribute to global warming for decades. Policies that reduce both cumulative GHG emissions and achieve the single-year 2030 target provide the most effective path to reducing climate change impacts. A cumulative construct provides a more complete way to evaluate the effectiveness of any measure over time, instead of just considering a snapshot for a single year.

TABLE 2: 2030 MODELING GHG RESULTS FOR THE REFERENCE SCENARIO AND KNOWN COMMITMENTS

Modeling Scenario	2030 GHG Emissions (MMTCO ₂ e)	Cumulative GHG Reductions 2021–2030 (MMTCO ₂ e)	Cumulative Gap to 2030 Target (MMTCO ₂ e)
Reference Scenario (Business-as-Usual)	389	n/a	621
Known Commitments	320	385	236

As noted above, the known commitments are expected to result in emissions that are 60 MMTCO₂e above the target in 2030, and have a cumulative emissions reduction gap of about 236 MMTCO₂e. This means the known commitments do not decline fast enough to achieve the 2030 target. The remaining 236 MMTCO₂e of estimated GHG emissions reductions would not be achieved unless further action is taken to reduce GHGs. Consequently, for the Scoping Plan Scenario, the Post-2020 Cap-and-Trade Program would need to deliver 236 MMTCO₂e cumulative GHG emissions reductions from 2021 through 2030. If the estimated GHG reductions from the known commitments are not realized due to delays in implementation or technology deployment, the post-2020 Cap-and-Trade Program would deliver the additional GHG reductions in the sectors it covers to ensure the 2030 target is achieved. Figure 7 illustrates the cumulative emissions reductions contributions of the known commitments and the Cap-and-Trade Program from 2021 to 2030.

Post-2020 Cap-and-Trade Program with Declining Caps

This measure would continue the Cap-and-Trade Program post-2020 pursuant to legislative direction in AB 398. The program is up and running and has a five-year-long record of auctions and successful compliance. In the face of a growing economy, dry winters, and the closing of a nuclear plant, it is delivering GHG reductions. This is not to say that California should continue on this road simply because the Cap-and-Trade Program is already in place. The analyses in this chapter, and the economic analysis in Chapter 3, clearly demonstrate that continuing the Cap-and-Trade Program through 2030 will provide the most secure, reliable, and feasible clean energy future for California—one that will continue to deliver crucial investments to improve the quality of life and the environment in disadvantaged communities.

Under this measure, funds would also continue to be deposited into the Greenhouse Gas Reduction Fund (GGRF) to support projects that fulfill the goals of AB 32, with AB 398 identifying a list of priorities for the Legislature to consider for future appropriations from GGRF. Investment of the Cap-and-Trade Program proceeds furthers the goals of AB 32 by reducing GHG emissions, providing net GHG sequestration, providing co-benefits, investing in disadvantaged communities and low-income communities, and supporting the long-term, transformative efforts needed to improve public and environmental health and

develop a clean energy economy. These investments support programs and projects that deliver major economic, environmental, and public health benefits for Californians. Importantly, prioritized investments in disadvantaged communities are providing a multitude of meaningful benefits to these communities some of which include increased affordable housing opportunities, reduced transit and transportation costs, access to cleaner vehicles, improved mobility options and air quality, job creation, energy cost savings, and greener and more vibrant communities.

Further, the Cap-and-Trade Program is designed to protect electricity and natural gas residential ratepayers from higher energy prices. The program includes a mechanism for electricity and natural gas utilities to auction their freely allocated allowances, with the auction proceeds benefiting ratepayers. The Climate Credit is a twice-annual bill credit given to investor-owned utility electricity residential customers. The total value of the Climate Credit for vintage 2013 auction allowances alone was over \$400 million. The first of these credits appeared on customer bills in April 2014.⁶² Currently, natural gas utilities are permitted to use a portion of their freely allocated allowances to meet their own compliance obligations; however, over time, they must consign a larger percentage of allowances and continue to provide the value back to customers.

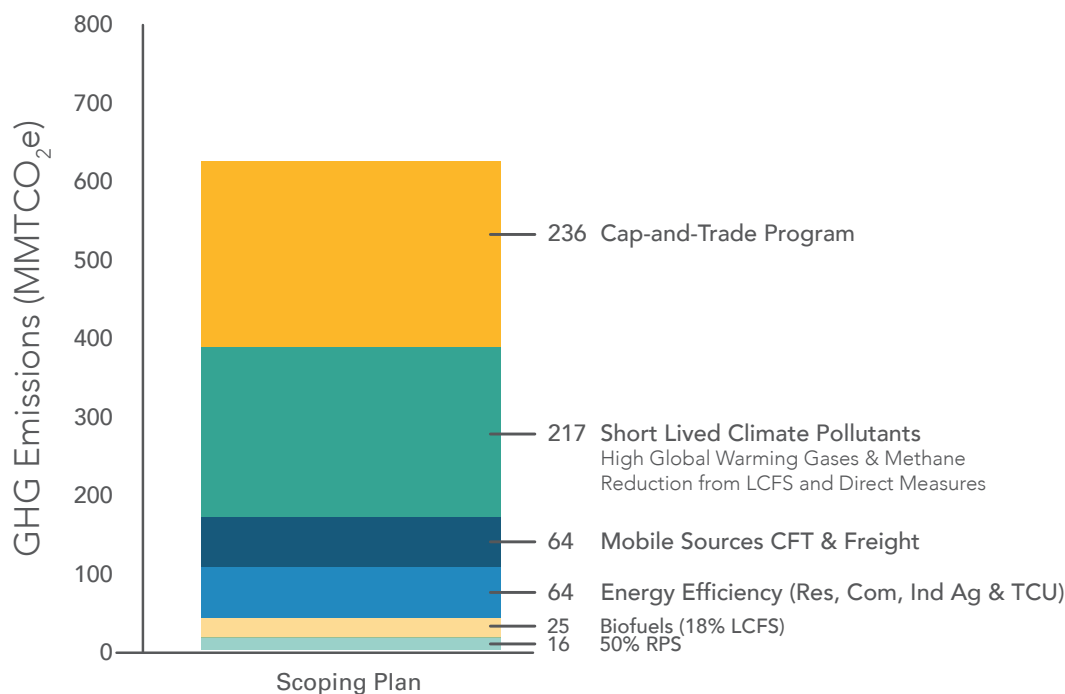
Additionally, under this measure, the State would preserve its current linkages with its Canadian partners and support future linkages with other jurisdictions, thus facilitating international action to address climate change. The high compliance rates with the Cap-and-Trade Program also demonstrate that the infrastructure and implementation features of the program are effective and understood by the regulated community. This measure also lends itself to integration with the Clean Power Plan requirements and is flexible to allow expansion to other sectors or regions.

In late 2017, CARB began evaluating changes to program design features for post-2020 in accordance with AB 398.⁶³ This includes changes to the offset usage limit, direction on allocation, two price containment points, and a price ceiling – which, if in the unlikely event were to be accessed, must result in GHG reductions by compensating for any GHG emissions above the cap, ensuring the environmental integrity of the program. Changes to conform to the requirements of AB 398 will be subject to a public process, coordinated with linked partners, and be part of a future rulemaking that would take effect by January 1, 2021.

62 www.arb.ca.gov/cc/capandtrade/allowanceallocation/edu-v2013-allowance-value-report.pdf

63 www.arb.ca.gov/cc/capandtrade/meetings/20171012/ct_presentation_11oct2017.pdf

FIGURE 7: SCOPING PLAN SCENARIO – ESTIMATED CUMULATIVE GHG REDUCTIONS BY MEASURE (2021–2030)⁶⁴



The Scoping Plan Scenario in Figure 7 represents an expected case where current and proposed GHG reduction policies and measures begin as expected and perform as expected, and technology is readily available and deployed on schedule. An Uncertainty Analysis was performed to examine the range of outcomes that could occur under the Scoping Plan policies and measures. The uncertainty in the following factors was characterized and evaluated:

- Economic growth through 2030;
- Emission intensity of the California economy;
- Cumulative emissions reductions (2021 to 2030) achieved by the prescriptive measures, including the known commitments; and
- Cumulative emissions reductions (2021 to 2030) that can be motivated by emission prices under the Cap-and-Trade Program.

The combined effects of these uncertainties are summarized in Figure 8. As shown in Figure 7, the Scoping Plan analysis estimates that the prescriptive measures will achieve cumulative emissions reductions of 385 MMTCO₂e, the Cap-and-Trade Program will achieve 236 MMTCO₂e, resulting in total cumulative emissions reductions of 621 MMTCO₂e. These values are again reflected in the bar on the left of Figure 8. The results of the Uncertainty Analysis are summarized in the three bars on the right of the figure as follows:

- The cumulative emissions reductions required to achieve the 2030 emission limit has the potential to be higher or lower than the Scoping Plan estimate. The uncertainty analysis simulates an average required emissions reductions of about 660 MMTCO₂e with a range of +130 MMTCO₂e.⁶⁵ This estimate and the range are shown in Figure 8 as the bar on the right. Notably, the estimate of the average required emissions reductions is 40 MMTCO₂e greater than the estimate in the Scoping Plan analysis.
- The prescriptive measures have the potential to underperform relative to expectations. Based on CARB staff assessments of the potential risk of underperformance of each measure, the average emissions reductions simulated to be achieved was 335 MMTCO₂e, or about 13 percent below the Scoping Plan estimate. The range for the performance of the measures was about +50 MMTCO₂e.

⁶⁴ The whole number values displayed in Figure 7 do not mathematically sum to 621 MMTCO₂e, consistent with the modeling results summary in Table 2. This is a result of embedded significant figures and rounding for graphic display purposes. Please refer to the corresponding PATHWAYS modeling data spreadsheets for details.

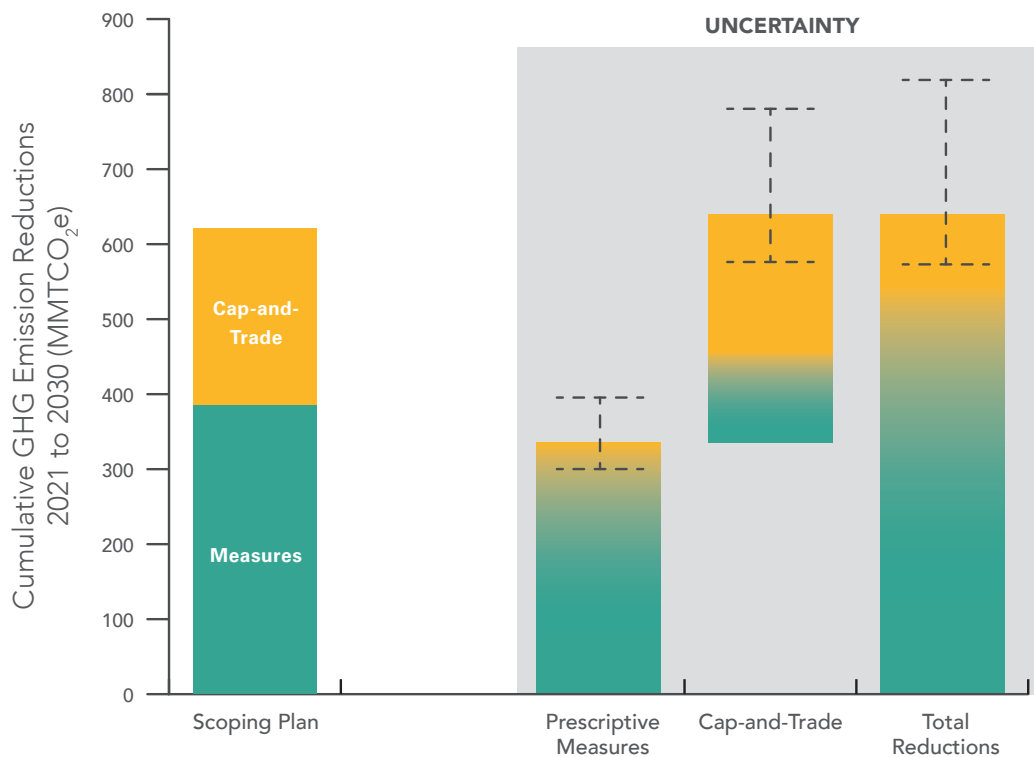
⁶⁵ The ranges presented are the 5th and 95th percentile observations in the Uncertainty Analysis. See Appendix E for details.

These values for the potential reductions achieved by the measures are shown in the figure.

- The Cap-and-Trade program is designed to fill the gap in the required emissions reductions over and above what is achieved by the prescriptive measures. Because the total required emissions reductions are uncertain, and the emissions reductions achieved by the prescriptive measures are uncertain, the required emissions reductions from the Cap-and-Trade Program are also uncertain. The Uncertainty Analysis simulated the average emissions reductions achieved by the Cap-and-Trade Program at about 305 MMTCO₂e, or about 30 percent higher than the Scoping Plan estimate. The range was simulated to be about +120 MMTCO₂e. These values for the potential reductions achieved by the Cap-and-Trade Program are shown in the figure.

The Uncertainty Analysis provides insight into the range of potential emissions outcomes that may occur, and demonstrates that the Scoping Plan, with the Cap-and-Trade Program, is extremely effective in the face of uncertainty, assuring that the required emissions reductions are achieved (see Appendix E for more detail). The Uncertainty Analysis also indicates that the Cap-and-Trade Program could contribute a larger or smaller share of the total required cumulative emissions reductions than expected in the Scoping Plan analysis.

FIGURE 8: UNCERTAINTY ANALYSIS



While the modeling results provide estimates of the GHG reductions that could be achieved by the measures, the results also provide other insights and highlight the need to ensure successful implementation of each measure. The SLCP Strategy will provide significant reductions with a focus on methane and hydrofluorocarbon gases. To ensure the SLCP Strategy implementation is successful, it will be critical to ensure programs such as LCFS maintain incentives to finance the capture and use of methane as a transportation fuel—further reducing the State’s dependence on fossil fuels. The modeling also shows that actions on energy efficiency could provide the same magnitude of GHG emissions reductions as the mobile source measures, but each effort will provide different magnitudes of air quality improvements and cost-effectiveness as discussed in Chapter 3.

Another way to look at this scenario is to understand the trajectory of GHG reductions over time, relative to the 2030 target. Figure 9 provides the trajectory of GHG emissions modeled for the Scoping Plan Scenario. Again, this depicts a straight-line path to the 2030 target for discussion purposes, but in reality GHG emissions may be above or below the line in any given year(s).

FIGURE 9: SCOPING PLAN SCENARIO GHG REDUCTIONS

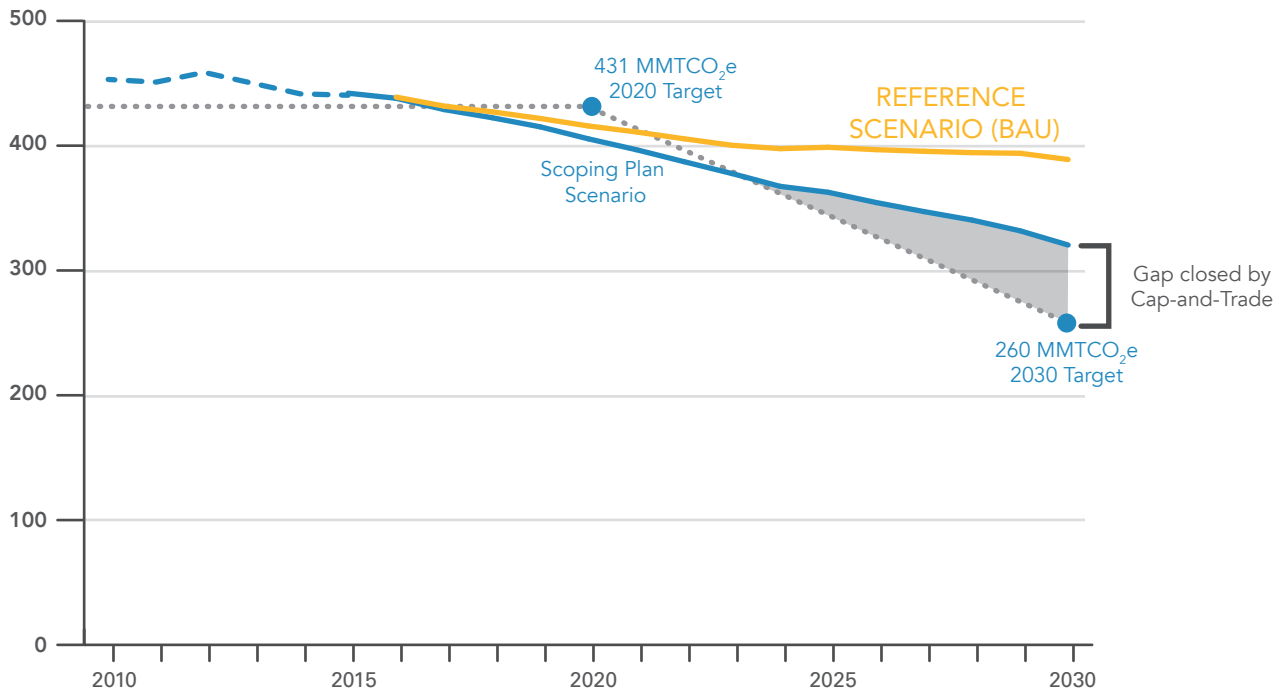


Figure 9 shows the Reference Scenario (yellow) and the version of the Scoping Plan Scenario that excludes the Cap-and-Trade Program (blue). Until 2023, the measures in the Scoping Plan Scenario constrain GHG emissions below the dotted straight line. After 2023, GHG emissions continue to fall, but at a slower rate than needed to meet the 2030 target. It is the Cap-and-Trade Program that will reduce emissions to the necessary levels to achieve the 2030 target. In this scenario, it is estimated that the known commitments will result in an emissions level of about 320 MMTCO₂e in 2030. Thus, for the Scoping Plan Scenario, the Cap-and-Trade Program would deliver about 60 MMTCO₂e in 2030 and ensure the 2030 target is achieved.

To understand how the Scoping Plan affects the main economic sectors, Table 3 provides estimated GHG emissions by sector, compared to 1990 levels, and the range of GHG emissions for each sector estimated for 2030. This comparison helps to illustrate which sectors are reducing emissions more than others and where to focus additional actions to reduce GHGs across the entire economy.

TABLE 3: ESTIMATED CHANGE IN GHG EMISSIONS BY SECTOR (MMTCO₂E)

	1990	2030 Scoping Plan Ranges ⁶⁶	% change from 1990
Agriculture	26	24–25	-8 to -4
Residential and Commercial	44	38–40	-14 to -9
Electric Power	108	30–53 ⁶⁷	-72 to -51
High GWP	3	8–11 ⁶⁸	267 to 367
Industrial	98	83–90 ⁶⁹	-15 to -8
Recycling and Waste	7	8–9 ⁷⁰	14 to 29**
Transportation (Including TCU)	152	103–111	-32 to -27
Natural Working Lands Net Sink*	-7***	TBD	TBD
Sub Total	431	294–339	-32 to -21
Cap-and-Trade Program	n/a	34–79	n/a
Total	431	260	-40

* Work is underway through 2017 to estimate the range of potential sequestration benefits from the natural and working lands sector.

** The SLCP will reduce emissions in this sector by 40 percent from 2013 levels. However, the 2030 levels are still higher than the 1990 levels as emissions in this sector have grown between 1990 and 2013.

*** This number reflects net results and is different than the intervention targets discussed in Chapter 4.

The sector ranges may change in response to how the sectors respond to the Cap-and-Trade Program. While the known commitments will deliver some reductions in each sector, the Cap-and-Trade Program will deliver additional reductions in the sectors it covers. Annual GHG reporting and the GHG inventory will track annual changes in emissions, and those will provide ongoing assessments of how each sector is reducing emissions due to the full complement of known commitments and the Cap-and-Trade Program, as applicable.

Scenario Modeling

There are a variety of models that can be used to model GHG emissions. For this Plan, the State is using the PATHWAYS model.⁷⁰ PATHWAYS is structured to model GHG emissions while recognizing the integrated nature of the industrial economic and energy sectors. For example, if the transportation sector adds more electric vehicles, PATHWAYS responds to reflect an energy demand increase in the electricity sector. However, PATHWAYS does not reflect any change in transportation infrastructure and land use demand associated with additional ZEVs on the road. The ability to capture a subset of interactive effects of policies and measures helps to provide a representation of the interconnected nature of the system and impacts to GHGs.

66 Unless otherwise noted, the low end of the sector range is the estimated emissions from the Scoping Plan Scenario and the high end adjusts the expected emissions by a risk factor that represents sector underperformance.

67 The high end of the electric power sector range is represented by the Scoping Plan Scenario, and the low end by enhancements and additional electricity sector measures such as deployment of additional renewable power, greater behind-the-meter solar PV, and additional energy efficiency. The electric power sector range provided in Table 3 will be used to help inform CARB's setting of the SB 350 Integrated Resource Plan greenhouse gas emissions reduction planning targets for the sector. CARB, CPUC, and CEC will continue to coordinate on this effort before final IRP targets are established for the sector, load-serving entities, and publicly-owned utilities. State agencies will investigate the potential for and appropriateness of deeper electric sector reductions in light of the overall needs of the Scoping Plan to cost-effectively achieve the statewide GHG goals. Concurrently, CEC and CPUC are proceeding with their respective IRP processes using this range.

68 The sector emissions are anticipated to increase by 2030. As such, the high end of the sector range is the estimated emissions from the Scoping Plan Scenario and the low end adjusts the expected emissions by a risk factor that represents sector over performance.

69 This estimate does not account for the reductions expected in this sector from the Cap-and-Trade Program. The Cap-and-Trade line item includes reductions that will occur in the industrial sector.

70 CARB. 2016. AB 32 Scoping Plan Public Workshops. www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm

At this time, PATHWAYS does not include a module for natural and working lands. As such, PATHWAYS cannot be used to model the natural and working lands sector, the interactive effects of policies aimed at the economic and energy sectors and their effect on land use or conditions, or the interactive effects of policies aimed at the natural environment and their impact on the economic and energy sectors. For this Plan, external inputs had to be developed for PATHWAYS to supply biofuel volumes. The natural and working lands sector is also being modeled separately as described in Chapter 4. Moving forward, CARB and other State agencies will work to integrate all the sectors into one model to fully capture interactive effects across both the natural and built environments.

Lastly, the PATHWAYS assumptions and results in this Plan show the significant action that the State must take to reach its GHG reduction goals. It is important to note that the modeling assumptions may differ from other models used by other State agencies. Modeling exercises undertaken in future regulatory proceedings may result in different measures, programs, and program results than those used in the modeling for this Scoping Plan. State agencies will engage on their specific policies and measure development processes separately from CARB Scoping Plan activities, in public forums to engage all stakeholders.

Uncertainty

Several types of uncertainty are important to understand in both forecasting future emissions and estimating the benefits of emissions reductions scenarios. In developing the Scoping Plan, we have forecast a Reference Scenario and estimated the GHG emissions outcome of the Scoping Plan using PATHWAYS. Inherent in the Reference Scenario modeling is the expectation that many of the existing programs will continue in their current form, and the expected drivers for GHG emissions such as energy demand, population growth, and economic growth will match our current projections. However, it is unlikely that the future will precisely match our projections, leading to uncertainty in the forecast. Thus, the single “reference” line should be understood to represent one possible future in a range of possible predictions. For the Scoping Plan Scenario, PATHWAYS utilized inputs that are assumptions external to the model. PATHWAYS was provided plausible inputs such as energy demand over time, the start years for specific policies, and the penetration rates of associated technologies. Each of the assumptions provided to PATHWAYS has some uncertainty, which is also reflected in the results. Thus, while the results presented in the Scoping Plan may seem precise due to the need for precision in model inputs, these results are estimates, and the use of ranges in some of the results is meant to capture that uncertainty.

Further, as noted in the November 7, 2016, 2030 Target Scoping Plan Workshop, “All policies have a degree of uncertainty associated with them.”⁷¹ As this Scoping Plan is meant to chart a path to achieving the 2030 target, additional work will be required to fully design and implement any policies identified in this Scoping Plan. During the subsequent development of policies, CARB and other State agencies will learn more about technologies, cost, and how each industry works as a more comprehensive evaluation is conducted in coordination with stakeholders. Given the uncertainty around assumptions used in modeling, and in performance once specific policies are fully designed and implemented, estimates associated with the Scoping Plan Scenario are likely to differ from what actually occurs when the Scoping Plan is implemented. One way to mitigate for this risk is to develop policies that can adapt and increase certainty in GHG emissions reductions. Periodic reviews of progress toward achieving the 2030 target and the performance of specific policies will also provide opportunities for the State to consider any changes to ensure we remain on course to achieve the 2030 target. The need for this periodic review process was anticipated in AB 32, as it calls for updates to the Scoping Plan at least once every five years. Additional information on the uncertainty analyses conducted in the development of this Scoping Plan is located in Appendix E.

71 Bushnell, James. Economic Modeling and Environmental Policy Choice. PowerPoint. Department of Economics, University of California, Davis. www.arb.ca.gov/cc/scopingplan/meetings/110716/bushnellpresentation.pdf

Policy Analysis of Scoping Plan Scenario

The following key criteria were considered while evaluating potential policies beyond the known commitments. The results of the economic analysis (presented in Chapter 3) were also important in the design of this Scoping Plan.

- **Ensure the State achieves the 2030 target.** The strategy must ensure that GHG emissions reductions occur and are sufficient to achieve the 2030 target.
- **Provide air quality co-benefits.** An important concern for environmental justice communities is for any Scoping Plan to provide air quality co-benefits.
- **Prioritize rules and regulations for direct GHG reductions.** AB 197 requires CARB in developing this Scoping Plan to prioritize emissions reductions rules and regulations that result in direct emissions reductions at large stationary sources of GHG emissions sources and direct emissions reductions from mobile sources.
- **Provide protection against emissions leakage.** Require any policies to achieve the statewide limits to minimize emissions leakage to the extent possible. Emissions leakage can occur when production moves out-of-state, so there appears to be a reduction in California's emissions, but the production and emissions have just moved elsewhere. This loss in production may be associated with loss in jobs and decreases in the State's gross domestic product (GDP) and could potentially increase global GHG emissions if the production moves to a less efficient facility outside of California.
- **Develop greenhouse gas reduction programs that can be readily exported to other jurisdictions.** Currently, California's Cap-and-Trade Program is linked with Québec's program and is scheduled to link with Ontario's cap-and-trade program beginning in 2018. At the same time, California's ambitious policies such as the RPS, LCFS, and Advanced Clean Cars have resulted in other regions adopting similar programs.
- **Minimize costs and increase investment in disadvantaged and low-income communities, and low-income households.** Currently, Cap-and-Trade auction proceeds from the sale of State-owned allowances are appropriated for a variety of programs to reduce GHGs, and provide other environmental, health and economic benefits including job creation and economic development. Under AB 1550, a minimum of 25 percent of the proceeds are to be invested in projects located in and benefiting disadvantaged communities, with an additional minimum 10 percent to projects in low-income communities, and low-income households. It is important to understand if the strategy will require or result in funding to support these GHG reductions and associated benefits.
- **Avoid or minimize the impacts of climate change on public health by continuing reductions in GHGs.** Climate change has the potential to significantly impact public health, including increases in heat illness and death, air pollution-related exacerbation of cardiovascular and respiratory diseases, injury and loss of life due to severe storms and flooding, increased vector-borne and water-borne diseases, and stress and mental trauma due to extreme weather-related catastrophes.
- **Provide compliance flexibility.** Flexibility is important as it allows each regulated entity the ability to pursue its own path toward compliance in a way that works best for its business model. Flexibility also acknowledges that regulatory agencies may not have a complete picture of all available low-cost compliance mechanisms or opportunities even across the same sector. In addition, under AB 32 and AB 197, the strategy to reduce GHGs requires consideration of cost-effectiveness, which compliance flexibility provides.
- **Support the Clean Power Plan and other federal climate programs.** California will continue to support aggressive federal action, as well as to defend existing programs like the Clean Power Plan, which is the most prominent federal climate regulation applicable to stationary sources. The U.S. Supreme Court has repeatedly confirmed that federal greenhouse gas regulation must move forward under the federal Clean Air Act, so it is important to ensure that California's programs can support federal compliance as well. Although continuing litigation has stayed certain Clean Power Plan deadlines in the near term, and U.S. EPA has proposed to reconsider aspects of the rule as issued, the Clean Power Plan remains the law of the land. California is vigorously defending this important program, and is continuing to support federal climate regulation as is required by law. U.S. EPA also has a legal obligation to implement GHG controls for power plants, even if it proposes to alter the form of those controls in the future. Therefore, the Clean Power Plan and other federal efforts are important considerations for this Scoping Plan. With regard to the

Clean Power Plan, California power plants are expected to be within their limits as set forth by the State's compliance plan, which was approved by CARB on July 27, 2017. However, the State still needs a mechanism to ensure the emissions for the covered electricity generating plants do not exceed the federal limits. This mechanism must be federally enforceable with regard to the affected power plants, and limit their emissions in accordance with the federal limit.

Table 4 uses the criteria listed above to assess the Scoping Plan Scenario. This assessment is based on CARB staff evaluation as well as the analyses described in Chapter 3.

TABLE 4: POLICY ASSESSMENT OF THE SCOPING PLAN

Criteria	Details
Ensure the State Achieves the 2030 Target	<ul style="list-style-type: none"> • Incorporates existing and new commitments to reduce emissions from all sectors • The Cap-and-Trade Program scales to ensure reductions are achieved, even if other policies do not achieve them. This is particularly critical given the uncertainty inherent in both CARB's emission forecast and its estimate of future regulations.
Provide Air Quality Co-Benefits	<ul style="list-style-type: none"> • Reduced fossil fuel use and increased electrification (including plug-in hybrid electric, battery-electric, and hydrogen fuel cell vehicles) from policies such as the Mobile Source Strategy, enhanced LCFS and RPS, energy efficiency, and land conservation will likely reduce criteria pollutants and toxic air contaminants. • The Cap-and-Trade Program will ensure GHG emissions reductions within California that may reduce criteria pollutants and toxic air contaminants.
Prioritize Rules and Regulations for Direct GHG Reductions	<ul style="list-style-type: none"> • Advanced Clean Cars regulations require reduction in the light-duty vehicle sector. • Enhanced LCFS requires reductions in light-duty and heavy-duty transportation. • SB 350, RPS, and energy efficiency will reduce the need for fossil power generation. • The Cap-and-Trade Program constrains and reduces emissions across approximately 80 percent of California GHG emissions. • SB 1383 and the Short-lived Climate Pollutant Reduction Strategy require reductions in the agricultural, commercial, residential, industrial, and energy sectors.
Protect Against Emissions Leakage	<ul style="list-style-type: none"> • Free allowance allocation to minimize leakage, where supported by research.
Develop GHG Reduction Programs that can be Readily Exported to Other Jurisdictions	<ul style="list-style-type: none"> • Supports existing and future linkages, allows for larger GHG emissions reductions worldwide through collaborative regional efforts. • Provides leadership on how to integrate short-lived climate pollutants into the broader climate mitigation program.
Minimize Costs and Invest in Disadvantaged and Low-Income Communities, and Low-Income Households	<ul style="list-style-type: none"> • Continue to fund programs and projects that reduce GHGs and meaningfully benefit disadvantaged and low-income communities and low-income households through the Greenhouse Gas Reduction Fund.
Avoid or Minimize the Impacts of Climate Change on Public Health	<ul style="list-style-type: none"> • Reduces GHGs and provides leadership nationally and internationally for climate action. • Provides funding for programs such as home weatherization focused on disadvantaged communities, to mitigate potential cost impacts.
Compliance Flexibility	<ul style="list-style-type: none"> • Regulated sources self-identify and implement some GHG emissions reductions actions, beyond those already required to comply with additional prescriptive measures.
Support the Clean Power Plan and other Federal Climate Programs	<ul style="list-style-type: none"> • Post-2020 Cap-and-Trade Program can be used to comply with the Clean Power Plan.

Chapter 3

EVALUATIONS

Programs for Air Quality Improvement in California

For half a century, CARB has been a leader in measuring, evaluating, and reducing sources of air pollution that impact public health. Its air pollution programs have been adapted for national programs and emulated in other countries. Significant progress has been made in reducing diesel particulate matter (PM), which is a designated toxic air contaminant, and many other hazardous air pollutants. CARB partners with local air districts to address stationary source emissions and adopts and implements State-level regulations to address sources of criteria and toxic air pollution, including mobile sources. The key air quality strategies being implemented by CARB include the following:

- **State Implementation Plans (SIPs).**⁷² These comprehensive plans describe how an area will attain national ambient air quality standards by deadlines established by the federal Clean Air Act. SIPs are a compilation of new and previously submitted plans, programs, air district rules, State regulations, and federal controls designed to achieve the emissions reductions needed from mobile sources, fuels, stationary sources, and consumer products. On March 23, 2017, CARB adopted the Revised Proposed 2016 State Strategy for the SIP, describing the commitments necessary to meet federal ozone and PM_{2.5} standards over the next 15 years.
- **Diesel Risk Reduction Plan.**⁷³ The plan, adopted by CARB in September 2000, outlined 14 recommended control measures to reduce the risks associated with diesel PM and achieve a goal of 75 percent PM reduction by 2010 and 85 percent by 2020. Since 2000, CARB has adopted regulations to reduce smog-forming pollutants and diesel PM from mobile vehicles and equipment (e.g., trucks, buses, locomotives, tractors, cargo handling equipment, construction equipment, marine vessels, transport refrigeration units); stationary engines and portable equipment (e.g., emergency standby generators, prime generators, agricultural irrigation pumps, portable generators); and diesel fuels. Diesel PM accounts for approximately 60 percent of the current estimated inhalation cancer risk for background ambient air.⁷⁴ CARB staff continues to work to improve implementation and enforcement efforts and examine needed amendments to increase the community health benefits of these control measures.
- **Sustainable Freight Action Plan.**⁷⁵ This joint agency strategy was developed in response to Governor's Executive Order B-32-15 to improve freight efficiency, transition to zero emission technologies, and increase the competitiveness of California's freight system. The transition of the freight transport system is essential to support the State's economic development in the coming decades and reduce air pollution affecting many California communities.
- **AB 32 Scoping Plan.**⁷⁶ This comprehensive strategy is updated at least every five years and is designed to achieve the State's climate goals, which includes measures that achieve air pollutant reduction co-benefits.
- **AB 1807.**⁷⁷ AB 1807 (Tanner, 1983) created California's program to reduce exposure to air toxics. CARB uses a comprehensive process to prioritize the identification of substances that pose the greatest health threat and to develop airborne toxic control measures to reduce those exposures. CARB has reduced public exposure to toxic air contaminants (TACs) through control of motor vehicles, fuels, consumer products, and stationary sources, including adopting control measures for

72 CARB. 2016. California State Implementation Plans. www.arb.ca.gov/planning/sip/sip.htm

73 CARB. 2000. Final Diesel Risk Reduction Plan with Appendices. www.arb.ca.gov/diesel/documents/rrpapp.htm

74 CARB and California Air Pollution Control Officers Association. 2015. Risk Management Guidance for Stationary Sources of Air Toxics. July 23. www.arb.ca.gov/toxics/rma/rmgssat.pdf

75 CARB. 2016. Sustainable Freight Transport. www.arb.ca.gov/gmp/sfti/sfti.htm

76 CARB. 2016. AB 32 Scoping Plan. www.arb.ca.gov/cc/scopingplan/scopingplan.htm

77 CARB. 2014. California Air Toxics Program – Background. www.arb.ca.gov/toxics/background.htm

industrial sources (e.g., perchloroethylene in automotive products; hexavalent chromium from cooling towers, automotive coatings and plating; ethylene oxide from sterilizers and aerators; dioxins from medical waste incinerators; perchloroethylene from dry cleaners; cadmium from metal melting).

- **AB 2588 Air Toxics “Hot Spots” Program.**⁷⁸ The Hot Spots Program supplements the AB 1807 program by requiring a statewide air toxics inventory, identification of facilities having localized impacts, notification of nearby residents exposed to a significant health risk, and facility risk management plans to reduce those significant risks to acceptable levels.
- **AB 617 Community Air Protection Program.** Together with the extension of the Cap-and-Trade Program and in recognition of ongoing air quality challenges, California has committed to expand its criteria and toxic emissions reductions efforts through the pursuit of a multipronged approach to reduce localized air pollution and address community exposure, framed by recently-signed new legislation, AB 617 (C. Garcia, 2017). AB 617 outlines actions in five core areas, to be completed in the 2018 to 2020 timeframe, to reduce criteria and toxic emissions in the most heavily impacted areas of the State:
 - **Community-scale air monitoring.** Ambient air monitoring is needed to evaluate the status of the atmosphere compared to clean air standards and historical data. Monitoring helps identify and profile air pollution sources, assess emerging measurement methods, characterize the degree and extent of air pollution, and track progress of emissions reductions activities. AB 617 requires a statewide assessment of the current air monitoring network and identification of priority locations where community-level air monitoring will be deployed.
 - **Statewide Strategy to reduce air pollutants impacting communities.** CARB will identify locations with high cumulative exposure to criteria and toxic pollutants, the sources contributing to those exposures, and select locations that will be required to develop a community action plan to reduce pollutants to acceptable levels.
 - **Community Action Plans to reduce emissions in identified communities.** High priority locations identified in the Statewide Strategy will need to prepare a community action plan that includes emissions reductions targets, measures, and an implementation timeline. The plan will be submitted to CARB for review and approval.
 - **Accelerated retrofits and technology clearinghouse.** This effort will focus on stationary source equipment at Cap-and-Trade facilities that, as of 2007, have not been retrofitted with BARCT-level emission controls for nonattainment pollutants. In addition, creation of a statewide clearinghouse that identifies BACT and BARCT technologies and emission levels for criteria pollutants and TACs will be developed to assist the air districts with the BARCT evaluation and identify available emission controls for the Statewide Strategy.
 - **Direct reporting of facility emissions data to CARB.** An improved, standardized emission inventory promotes a better understanding of actual emissions and helps identify major emission sources, priorities for emissions reduction, and data gaps requiring further work. AB 617 requires CARB to establish a uniform emission inventory system for stationary sources of criteria pollutants and TACs. Data integration and transparency-related efforts are already required by AB 197 (E. Garcia, 2016) and underway at CARB, so this new task will build on these efforts. Moreover, it is clear that better data reporting is necessary to identify localized exposure risk to harmful criteria and toxic pollutants and actions to address any localized impacts must be taken as quickly as possible.

To support efforts to advance the State’s toxics program, the Office of Environmental Health Hazard Assessment (OEHHHA) finalized a new health risk assessment methodology, *Air Toxics Hot Spots Program Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments*, on March 6, 2015, which updates the previous version of the guidance manual and reflects advances in the field of risk assessment along with explicit consideration of infants and children.⁷⁹ Subsequently, CARB, in collaboration with the California Air Pollution Control Officers Association (CAPCOA), finalized a *Risk Management Guidance for Stationary Sources of Air Toxics* for the air districts to use to incorporate OEHHHA’s new health risk assessment methodology into their stationary source permitting and AB 2588 Air Toxics Hot Spots programs.⁸⁰

Together, all of these efforts will reduce criteria and toxics emissions in the State, with a focus on the most burdened communities. In particular, AB 617 responds to environmental justice concerns that the Cap-and-

78 CARB. 2016. AB 2588 Air Toxics “Hot Spots” Program. www.arb.ca.gov/ab2588/ab2588.htm

79 OEHHHA. 2015. Notice of Adoption of Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments 2015. <http://oehha.ca.gov/air/crn/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0>

80 www.arb.ca.gov/toxics/rma/rmgssat.pdf

Trade Program does not force large GHG emitters to reduce air pollution which results in localized health impacts. Prior to the passage of AB 617, in February 2017, OEHHA published the first in a series of reports tasked with evaluating the impacts of California's climate change programs on disadvantaged communities. The initial report focused on the Cap-and-Trade Program.⁸¹ Future reports will focus on the impacts of other climate programs on disadvantaged communities. The report confirms disadvantaged communities are frequently located close to large stationary and mobile sources of emissions. It also notes there are complexities in trying to correlate GHGs with criteria and toxics emissions across industry and within sectors, although preliminary data review shows there may be some poor to moderate correlations in specific instances. Lastly, the report noted, "...the emissions data available at this time do not allow for a conclusive analysis."

Two additional reports were released during this same period of time: a California Environmental Justice Alliance (CEJA) report focused on identifying equity issues for disadvantaged communities resulting from the implementation of the Cap-and-Trade Program⁸² and a research paper examining the question of whether the Cap-and-Trade Program is causing more GHG emissions in disadvantaged communities when compared to other regions.⁸³ Both of these reports also confirmed that disadvantaged communities are disproportionately located close to large stationary and mobile sources of emissions. While the CEJA report noted, "Further research is needed before firm policy conclusions can be drawn from this preliminary analysis," the research paper, in reference to GHGs, states, "By and large, the annual change in emissions across disadvantaged and non-disadvantaged communities look similar."

While the reports do not provide evidence that implementation of the Cap-and-Trade Program is contributing to increased local air pollution, they do underscore the need to use all of the tools (e.g., enhanced enforcement, new regulations, tighter permit limits) available to the State and local agencies to achieve further emissions reductions of toxic and criteria pollutants that are impacting community health. Importantly, AB 617 provides a new framework and tools for CARB, in collaboration with local air districts, to deploy focused monitoring and ensure criteria and toxics emissions reductions at the State's largest GHG emitters.

AB 197 Measure Analyses

This section provides the required AB 197 estimates for the measures evaluated in this Scoping Plan. These estimates provide information on the relative impacts of the evaluated measures when compared to each other. To support the design of a suite of policies that result in GHG reductions, air quality co-benefits, and cost-effective measures, it is important to understand if a measure will increase or reduce criteria pollutants or toxic air contaminant emissions, or if increasing stringency at additional costs yields few additional GHG reductions. To this end, AB 197 (E. Garcia, Chapter 250, Statutes of 2016) requires the following for each potential reduction measure evaluated in any Scoping Plan update:

- The range of projected GHG emissions reductions that result from the measure.
- The range of projected air pollution reductions that result from the measure.
- The cost-effectiveness, including avoided social costs, of the measure.

As the Scoping Plan was developed, it was important to understand if any of the proposed policies or measures would increase criteria pollutant or toxic air contaminant emissions. Note the important caveats around some of the estimates; they must be considered when using the information in the tables below for purposes other than as intended.

Estimated Emissions Reductions for Evaluated Measures

For many of the existing programs with known commitments, such as the Mobile Source Strategy, previous analyses provide emission factors or other methods for estimating the impacts required by AB 197. Where available, these values were used. In some cases, estimates are based on data from other sources, such as the California Public Utilities Commission (CPUC) Renewables Portfolio Standard Calculator. For newly proposed measures, assumptions were required to estimate the values. Consequently, the estimates for the newly proposed measures have substantial uncertainty. The uncertainty in the impacts of these measures would be reduced as the measures are defined in greater detail during the regulatory processes that are undertaken to

81 <https://oehha.ca.gov/media/downloads/environmental-justice/report/oehhaab32report020217.pdf>

82 <http://dornsife.usc.edu/PERE/enviro-equity-CA-cap-trade>

83 https://www.dropbox.com/s/se3ibxkv8t4at8g/Meng_CA_EJ.pdf?dl=1

define and adopt the programs. For example, as a measure is developed in detail, ways to obtain additional co-pollutant reductions or avoid co-pollutant increases may be identified and evaluated.

Table 5 provides the estimates for the measures evaluated during the development of the Scoping Plan. Based on the estimates below, these measures are expected to provide air quality benefits. The table also provides important context, limitations, and caveats about the values. As shown, the table includes criteria pollutant and diesel PM estimates. As mentioned in the Diesel Risk Reduction Plan, diesel PM accounts for 60 percent of the current estimated inhalation cancer risk for background ambient air. As we do not have direct modeling results for criteria and toxic pollutant estimates from PATHWAYS, we are estimating air quality benefits by using reductions in GHGs to assign similar reductions for criteria and toxic pollutants. By assigning an arbitrary 1:1 relationship in changes between GHGs and criteria and toxic pollutants, the air quality reductions likely overestimate the actual reductions from implementation of the measures. As noted in the OEHHA report, the exact relationship between GHGs and air pollutants is not clearly understood at this time. Moving forward, CARB will continue to assess the nature of the exact relationship between GHGs and criteria and toxics emissions. All estimates in Table 5 have some inherent uncertainty. The table allows for assessing measures against each other and should not be used for other purposes without understanding the limitations on the how the air quality values are derived.

Table 6 provides a summary of the total estimated emissions reductions for the Scoping Plan Scenario as outlined in Table 1. Table 6 was developed by adding the estimated emissions reductions for all of the measures included within the Scoping Plan Scenario in Table 1. More detail on the estimates for the Scoping Plan Scenario, as well as the specific measures included in each of the other four alternative scenarios can be found in Appendix G. In 2030, the Scoping Plan scenario and alternatives will provide comparable GHG and air quality reductions. When there is a range, the measure or policy should be designed to maximize the benefit to the extent possible.

TABLE 5: RANGES OF ESTIMATED AIR POLLUTION REDUCTIONS BY POLICY OR MEASURE IN 2030

Measure	Range of NO _x Reductions (Tons/Day)	Range of VOC Reductions (Tons/Day)	Range of PM _{2.5} Reductions (Tons/Day)	Range of Diesel PM Reductions (Tons/Day)
50 percent RPS	~0.5	<0.1	~0.4	< 0.01
Mobile Sources CTF and Freight	51–60	4.6–5.5	~1.1	~0.2
18 percent Carbon Intensity Reduction Target for LCFS - Liquid Biofuels*	3.5–4.4	0.5–0.6	0.4–0.6	~0.5
Short-Lived Climate Pollutant Strategy	–	–	–	–
2x additional achievable energy efficiency in the 2015 Integrated Energy Policy Report (IEPR)	0.4–0.5	0.5–0.7	< 0.1	< 0.01
Cap-and-Trade Program	A	A	A	4–9

- * LCFS estimates include estimates of the NO_x and PM_{2.5} tailpipe benefits limited to renewable diesel consumed in the off-road sector.
 - CARB is evaluating how to best estimate these values. Criteria and toxic values are shown in tons per day, as they are episodic emissions events with residence times of a few hours to days, unlike GHGs, which have atmospheric residence times of decades.
 - A Due to the inherent flexibility of the Cap-and-Trade Program, as well as the overlay of other complementary GHG reduction measures, the mix of compliance strategies that individual facilities may use is not known. However, based on current law and policies that control industrial and electricity generating sources of air pollution, and expected compliance responses, CARB believes that emissions increases at the statewide, regional, or local level due to the regulation are not likely. A more stringent post-2020 Cap-and-Trade Program will provide an incentive for covered facilities to decrease GHG emissions and any related emissions of criteria and toxic pollutants. Please see CARB's Co-Pollutant Emissions Assessment for a more detailed evaluation of a cap-and-trade program and associated air emissions impacts: www.arb.ca.gov/regact/2010/capandtrade10/capv6appp.pdf
- NO_x = nitrogen oxides; VOC = volatile organic compound

Important: These estimates assume a 1:1 relationship between changes in GHGs, criteria pollutants, and toxic air contaminant emissions, and it is unclear whether that is ever the case. The values should not be considered estimates of absolute changes for other analytical purposes and only allow for comparison across measures in the table. The values are estimates that represent current assumptions of how programs may be implemented; actual impacts may vary depending on the design, implementation, and performance of the policies and measures. The table does not show interactions between measures, such as the relationship with increased transportation

electrification and associated increase in energy demand for the electricity sector. The measures in the Scoping Plan Scenario are shown in bold font in the table below. Additional details, including GHG reductions, are available in Appendix G.

TABLE 6: SUMMARY OF RANGES OF ESTIMATED AIR POLLUTION REDUCTIONS FOR THE SCOPING PLAN SCENARIO IN 2030

Scenario	Range of NO _x Reductions (Tons/Day)	Range of VOC Reductions (Tons/Day)	Range of PM _{2.5} Reductions (Tons/Day)	Range of Diesel PM Reductions (Tons/Day)
Scoping Plan Scenario	48–73	5.1–7.3	1.4–2.4	5–10

The total estimates for air pollution reductions provided in this table for the Scoping Plan Scenario are estimated by adding the air pollution benefits for the subset of individual measures examined in Table 5 and included in the Scoping Plan Scenario described in Table 1, and scaled by a risk adjustment factor to capture interactive effects and risks of under/over achieving on air pollution reductions. Appendix G includes details of the specific measures in the Scoping Plan Scenario and Alternatives. **All caveats in Table 5 apply to air quality estimates in this table.**

Estimated Social Costs of Evaluated Measures

Consideration of the social costs of GHG emissions is a requirement in AB 197, including evaluation of the avoided social costs for measures within this Scoping Plan.⁸⁴ Social costs are generally defined as the cost of an action on people, the environment, or society and are widely used to evaluate the impact of regulatory actions. Social costs do not represent the cost of abatement or the cost of GHG reductions, rather social costs estimate the harm that is avoided by reducing GHGs.

Since 2008, federal agencies have been incorporating the social costs of GHGs, including carbon dioxide, methane, and nitrous oxide into the analysis of their regulatory actions. Agencies including the U.S. Environmental Protection Agency (U.S. EPA), Department of Transportation (DOT), and Department of Energy (DOE) are subject to Executive Order 12866, which directs agencies “to assess both the costs and benefits of the intended regulation...”.⁸⁵ In 2007, the National Highway Transportation Safety Administration (NHTSA) was directed by the U.S. 9th Circuit Court of Appeals to include the social cost of carbon in a regulatory impact analysis for a vehicle fuel economy rule. The Court stated that “[w]hile the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero.”⁸⁶

In 2009, the Council of Economic Advisors and the Office of Management and Budget convened the Interagency Working Group on the Social Cost of Greenhouse Gases⁸⁷ (IWG) to develop a methodology for estimating the social cost of carbon (SC-CO₂). This methodology relied on a standardized range of assumptions and could be used consistently when estimating the benefits of regulations across agencies and around the world. The IWG, comprised of scientific and economic experts, recommended the use of SC-CO₂ values based on three integrated assessment models (IAMs) developed over decades of global peer-reviewed research.⁸⁸

In this Scoping Plan, CARB utilizes the current IWG supported SC-CO₂ values to consider the social costs of actions to reduce GHG emissions. This approach is in line with Executive Orders including 12866 and the OMB Circular A-4 of September 17, 2003, and reflects the best available science in the estimation of the socio-economic impacts of carbon.⁸⁹ CARB is aware that the current federal administration has recently withdrawn certain social cost of carbon reports as no longer representative of federal governmental policy.⁹⁰ However, this determination does not call into question the validity and scientific integrity of federal social

84 AB 197 text available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB197.

85 https://www.reginfo.gov/public/jsp/Utilities/EO_12866.pdf

86 Center for Biological Diversity v National Highway Traffic Safety Administration 06-71891 (9th Cir, November 15 2007)

87 Originally titled the Interagency Working Group on the Social Cost of Carbon, the IWG was renamed in 2016.

88 Additional technical detail on the IWG process is available in the Technical Updates of the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866. Iterations of the Updates are available at: <https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf>, <https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc-tds-final-july-2015.pdf>, and https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc_tsd_final_clean_8_26_16.pdf.

89 OMB circular A-4 is available at: <https://www.transportation.gov/sites/dot.gov/files/docs/OMB%20Circular%20No.%20A-4.pdf>.

90 See Presidential Executive Order, March 28, 2017, sec. 5(b).

cost of carbon work, or the merit of independent scientific work. Indeed, the IWG’s work remains relevant, reliable, and appropriate for use for these purposes.

The IWG describes the social costs of carbon as follows:

The social cost of carbon (SC-CO₂) for a given year is an estimate, in dollars, of the present discounted value of the future damage caused by a 1-metric ton increase in carbon dioxide (CO₂) emissions into the atmosphere in that year, or equivalently, the benefits of reducing CO₂ emissions by the same amount in that year. The SC-CO₂ is intended to provide a comprehensive measure of the net damages – that is, the monetized value of the net impacts – from global climate change that result from an additional ton of CO₂.

These damages include, but are not limited to, changes in net agricultural productivity, energy use, human health, property damage from increased flood risk, as well as nonmarket damages, such as the services that natural ecosystems provide to society. Many of these damages from CO₂ emissions today will affect economic outcomes throughout the next several centuries.⁹¹

Table 7. presents the range of IWG SC-CO₂ values used in regulatory assessments including this Scoping Plan.⁹²

TABLE 7: SC-CO₂, 2015-2030 (IN 2007 \$ PER METRIC TON)

Year	5 Percent Discount Rate	3 Percent Discount Rate	2.5 Percent Discount Rate
2015	\$11	\$36	\$56
2020	\$12	\$42	\$62
2025	\$14	\$46	\$68
2030	\$16	\$50	\$73

The SC-CO₂ is year specific, that is, the IAMs estimate the environmental damages from a given year in the future and discount the value of the damages back to the present. For example, the SC-CO₂ for the year 2030 represents the value of climate change damages from a release of CO₂ in 2030 discounted back to today. The SC-CO₂ increases over time as systems become stressed from the aggregate impacts of climate change and future emissions cause incrementally larger damages. Table 7 presents the SC-CO₂ across a range of discount rates – or the value today of preventing environmental damages in the future. A higher discount rate decreases the value placed on future environmental damages. This Scoping Plan utilizes the IWG standardized range of discount rates, from 2.5 to 5 percent to represent varying valuation of future damages.

The SC-CO₂ is highly sensitive to the discount rate. Higher discount rates decrease the value today of future environmental damages. This Scoping Plan utilizes the IWG standardized range of discount rates, from 2.5 to 5 percent to represent varying valuation of future damages. The value today of environmental damages in 2030 is higher under the 2.5 percent discount rate compared to the 3 or 5 percent discount rate, reflecting the trade-off of consumption today and future damages. The IWG estimates the SC-CO₂ across a range of discount rates that encompass a variety of assumptions regarding the correlation between climate damages and consumption of goods and is consistent with OMB’s Circular A-4 guidance.⁹³

There is an active discussion within government and academia about the role of SC-CO₂ in assessing regulations, quantifying avoided climate damages, and the values themselves. In January 2017, the National Academies of Sciences, Engineering, and Medicine (NAS) released a report examining potential approaches for a comprehensive update to the SC-CO₂ methodology to ensure resulting cost estimates reflect the best available science. The NAS review did not modify the estimated values of the SC-CO₂, but evaluated the models, assumptions, handling of uncertainty, and discounting used in the estimating of the SC-CO₂. The report titled, “Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide,” recommends near-term improvements to the existing IWG SC-CO₂ as well as a long-term strategy to more comprehensive updates.⁹⁴ The State will continue to follow updates to the IWG SC-CO₂, including changes

91 From The National Academies, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide, 2017, available at: <http://www.nap.edu/24651>
92 The SC-CO₂ values as of July 2015 are available at: <https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc-tsd-final-july-2015.pdf>
93 The National Academies, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide, 2017, available at: <http://www.nap.edu/24651>.
94 The National Academies, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide, 2017, available at:

outlined in the NAS report, and incorporate appropriate peer-reviewed modifications to estimates based on the latest available data and science.

It is important to note that the SC-CO₂, while intended to be a comprehensive estimate of the damages caused by carbon globally, does not represent the cumulative cost of climate change and air pollution to society. There are additional costs to society outside of the SC-CO₂, including costs associated with changes in co-pollutants, the social cost of other GHGs including methane and nitrous oxide, and costs that cannot be included due to modeling and data limitations. The IPCC has stated that the IWG SC-CO₂ estimates are likely underestimated due to the omission of significant impacts that cannot be accurately monetized, including important physical, ecological, and economic impacts.⁹⁵ CARB will continue engaging with experts to evaluate the comprehensive California-specific impacts of climate change and air pollution.

The Social Cost of GHG Emissions

Social costs for methane (SC-CH₄) and nitrous oxide (SC-N₂O) have also been developed using methodology consistent with that used in estimating the IWG SC-CO₂. These social costs have also been endorsed by the IWG and have been used in federal regulatory analyses.⁹⁶ Along with the SC-CO₂, the State also supports the use of the SC-CH₄ and SC-N₂O in monetizing the impacts of GHG emissions.

While the SC-CO₂, SC-CH₄, and SC-N₂O provide metrics to account for the social costs of climate change, California will continue to analyze ways to more comprehensively identify the costs of climate change and air pollution to all Californians. This will include following updates to the IWG methodology and social costs of GHGs and incorporating the SC-CO₂, SC-CH₄, and SC-N₂O into regulatory analyses.

Table 9 presents the estimated social cost for each policy or measure considered in the development of the Scoping Plan in 2030. For each measure or policy, Table 9 includes the range of the IWG SC-CO₂ values that result from the anticipated range of GHG reductions in 2030 presented in Appendix G. The SC-CO₂ range is obtained using the IWG SC-CO₂ values in 2030 at the 2.5, 3, and 5 percent discount rates. These values (of \$16 using the 5 percent discount rate, \$50 using the 3 percent discount rate, and \$73 using the 2.5 percent discount rate) are translated into 2015 dollars and multiplied across the range of estimated reductions by measure in 2030 to estimate the value of avoided social costs from each measure in that year.⁹⁷

Implementation of the SLCP Strategy will result in reduction of a variety of GHGs, including methane and HFCs, which reported in carbon dioxide equivalent (CO₂e). While there is no social cost of CO₂e, the avoided damages associated with the methane reductions outlined in the SLCP Strategy are estimated in Table 9 using the IWG SC-CH₄ as presented in Table 8.⁹⁸

TABLE 8: SC-CH₄, 2015-2030 (IN 2007\$ PER METRIC TON)

Year	5 Percent Discount Rate	3 Percent Discount Rate	2.5 Percent Discount Rate
2015	\$450	\$1000	\$1400
2020	\$540	\$1200	\$1600
2025	\$650	\$1400	\$1800
2030	\$760	\$1600	\$2000

The range of SC-CH₄ is obtained using the IWG SC-CH₄ values in 2030 at the 2.5, 3, and 5 percent discount rates. The SC-CH₄ values (e.g., \$760 using the 5 percent discount rate, \$1,600 using the 3 percent discount rate, and \$2,000 using the 2.5 percent discount rate) are translated into 2015 dollars and multiplied across the range of estimated methane reductions in 2030 to estimate the value of climate benefits from the SLCP

<http://www.nap.edu/24651>
95 https://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch3s3-5-3-3.html
96 More information is available at: https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/august_2016_sc_ch4_sc_n2o_addendum_final_8_26_16.pdf
97 The IWG SC-CO₂ values are in 2007 dollars. In 2015 dollars, \$16, \$50, and \$73 in 2007 translates to about \$18, \$57, and \$83, respectively, based on the Bureau of Labor Statistics GDP Series Table 1.1.4.
98 https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/august_2016_sc_ch4_sc_n2o_addendum_final_8_26_16.pdf

Strategy.⁹⁹ As the social cost associated with the SLCP Strategy does not include the impact associated with non-methane reductions, Table 9 underestimates the avoided social costs of this Scoping Plan as calculated using the IWG valuations.

As this Scoping Plan is a suite of policies developed to reduce GHGs to a specific level in 2030, any alternative scenario that also achieves the 2030 target (with the same proportion of carbon dioxide and methane reductions) will have the same avoided social cost, as estimated using the IWG social cost of GHGs, for the single year 2030. The social costs of alternatives could vary if the 2030 target is achieved with vastly different ratios of carbon dioxide to methane reductions. However, all alternatives in this Scoping Plan are anticipated to achieve the same proportion of carbon dioxide and methane reductions and will therefore all have the same estimated avoided social damage or social cost. This social cost, as estimated in 2030 using the IWG SC-CO₂ and SC-CH₄, ranges from \$1.9 to \$11.2 billion using the 2.5 to 5 percent discount rates, and is estimated at \$5.0 to \$7.8 billion using the 3 percent discount rate. For example, in Table 9 the CH₄ reductions for the SCLP strategy are about 1 MMTCH₄. That value is multiplied by the 2030 SC-CH₄ values in Table 8 for the 2030 values at the 2.5 and 5 percent discount rates to get a range of \$860 to \$2,260 in 2015 dollars.

⁹⁹ The IWG.SC-CH₄ values are in 2007 dollars. In 2015 dollars, the range of SC-CH₄ translates to about \$858, \$1,807, and \$2,259, for the 5 percent, 3 percent, and 2.5 percent discount rates, respectively. These values are based on the Bureau of Labor Statistics GDP Series Table 1.1.4.

TABLE 9: ESTIMATED SOCIAL COST (AVOIDED ECONOMIC DAMAGES) OF POLICIES OR MEASURES CONSIDERED IN THE 2017 SCOPING PLAN DEVELOPMENT[#]

Measure (Measures in bold are included in the Scoping Plan)	Range of Social Cost of Carbon \$ million USD (2015 dollars)**
50 percent Renewables Portfolio Standard (RPS)	\$55–\$250
Mobile Sources CTF and Freight	\$200–\$1,080
18 percent Carbon Intensity Reduction Target for LCFS -Liquid Biofuels	\$70–\$330
Short-Lived Climate Pollutant Strategy	\$860–\$2,260 (SC-CH ₄)
2x additional achievable energy efficiency in the 2015 IEPR	\$125–\$750
Cap-and-Trade Program	\$610–\$6,560
10 percent incremental RPS and additional 10 GW behind-the-meter solar PV*	\$250–\$1,160
25 percent Carbon Intensity Reduction Target for LCFS and a Low-Emission Diesel Standard - Liquid Biofuels*	\$90–\$415
20 percent Refinery	\$55–\$500
30 percent Refinery	\$20–\$250
25 percent Industry	\$20–\$415
25 percent Oil and Gas	\$35–\$330
5 percent Increased Utilization of RNG (core and non-core)	\$35–\$165
Mobile Source Strategy (CTF) with Increased ZEVs in South Coast and early retirement of LDVs with more efficient LDVs*	\$55–\$500
2.5x additional achievable energy efficiency in the 2015 IEPR, electrification of buildings (heat pumps and res. electric stoves) and early retirement of HVAC*	\$70–\$580
Carbon Tax	\$775–\$8,300
All Cap-and-Trade	\$700–\$6,890
Cap-and-Tax	\$775–\$8,300
Scoping Plan Scenario SC-CO ₂	\$1,060–\$8,970
Scoping Plan Scenario SC-CH ₄	\$860–\$2,260
Scoping Plan Scenario (Total)	\$1,920–\$11,230

Note: All values are rounded. The values for SC-CO₂ and SC-CH₄ in 2030 are presented in Tables 7 and 8.

* Where enhancements have been made to a measure or policy, the ranges in emissions reductions are incremental to the original measure. For example, the ranges for the 25 percent LCFS are incremental to the emissions ranges for the 18 percent LCFS.

Measures included in the Scoping Plan and the All Cap-and-Trade measure reflect emissions reductions from modeling changes after passage of AB 398. Emissions reductions from all other measures reflect modeling completed prior to passage of AB 398. See Appendix G for additional details.

** All values have been rounded to the nearest 0 or 5.

~ Some measures do not show a significant change in 2030 when there is an incremental increase in measure stringency or when modeling uncertainty was factored.

Social Costs of GHGs in Relation to Cost-Effectiveness

AB 32 includes a requirement that “rules and regulations achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions.”¹⁰⁰ Under AB 32, cost-effectiveness means the relative cost per metric ton of various GHG reduction strategies, which is the traditional cost metric associated with emission control. In contrast, the SC-CO₂, SC-CH₄, and SC-N₂O are estimates of the economic benefits, and not the cost of reducing GHG emissions.

There may be technologies or policies that do not appear to be cost-effective when compared to the SC-CO₂, SC-CH₄, and SC-N₂O associated with GHG reductions. However, these technologies or policies may result in other benefits that are not reflected in the IWG social costs. For instance, the evaluation of social costs might include health impacts due to changes in local air pollution that result from reductions in GHGs, diversification of the portfolio of transportation fuels (a goal outlined in the LCFS) and reductions in criteria pollutant emissions from power plants (as in the RPS).

Estimated Cost Per Metric Ton by Measure

AB 197 also requires an estimation of the cost-effectiveness of the potential measures evaluated for the Scoping Plan. The values provided in Table 10 are estimates of the cost per metric ton of estimated reductions for each measure in 2030. To capture the fuel and GHG impacts of investments made from 2021 through 2030 to meet the 2030 GHG goal, the table also includes an evaluation of the cost per metric ton based on the cumulative GHG emissions reductions and cumulative costs or savings for each potential measure from 2021 through 2030. While it is important to understand the relative cost effectiveness of measures, the economic analysis presented in Appendix E provides a more comprehensive analysis of how the Scoping Plan and alternative scenarios affect the State’s economy and jobs.

The cost (or savings) per metric ton of CO₂e reduced for each of the measures is one metric for comparing the performance of the measures. Additional factors beyond the cost per metric ton that could be considered include continuity with existing laws and policies, implementation feasibility, contribution to fuel diversity and technology transformation goals, as well as health and other benefits to California. These considerations are not reflected in the cost per ton metric below.

Because many of the measures interact with each other, isolating the cost and GHG savings of an individual measures is analytically challenging. For example, the performance of the renewable electricity measure impacts the GHG savings and cost per ton associated with increasing the use of electric vehicles. Likewise, the increased use of electric vehicles may increase flexible loads on the electric system, enabling increased levels of renewable electricity to be achieved more cost effectively. Both the renewable electricity measure and the increased use of electric vehicles affect the cost of meeting the Low-Carbon Fuel Standard.

For most of the measures shown in Table 10, the 2030 cost per metric ton is isolated from the other measures by performing a series of sensitivity model runs in the California PATHWAYS model. This cost per metric ton is calculated as the difference in the 2030 annualized cost (or savings) with and without the measure. For the measures in the Scoping Plan Scenario, the analysis starts with the Scoping Plan Scenario PATHWAYS estimates, and then costs and emissions are recalculated with each measure removed individually. For measures included in the No Cap-and-Trade Scenario, the approach starts with the No Cap-and-Trade Scenario PATHWAYS estimates and then each measure is removed. Using this approach, the incremental impact on GHG emissions and costs for each measure is calculated. The incremental cost in 2030 is divided by the incremental GHG emission impact to calculate the cost per ton in 2030.

The same approach of removing each measure individually is used to estimate the incremental cost and emission impacts of each measure for the period 2021 to 2030. For each measure, its annual incremental costs from 2021 to 2030 are calculated and then discounted to 2021 using the discount rate used in PATHWAYS to levelize capital costs over the life of equipment. As a result, the discounted incremental cost of each measure is the total investment required from 2021 to 2030 to achieve each measure’s emissions reductions from 2021 to 2030 (including both incremental capital costs and incremental fuel savings/expenditures). This discounted cost for each measure was divided by its cumulative emissions reductions from 2021 to 2030 to calculate a cost per ton for the measure for the period. A second calculation was also made that divides each measure’s discounted cost by its discounted emissions reductions from 2021 to 2030. The

100 www.arb.ca.gov/cc/docs/ab32text.pdf

same discount rate is used to discount both incremental costs and emissions in this approach. The estimates are presented in the table below.

Costs that represent transfers within the state, such as incentive payments for early retirement of equipment, are not included in this California total cost metric. The cost ranges shown below represent some of the uncertainty inherent in estimating this metric. The details of how the ranges for each measure were estimated are described in the footnotes below. All cost estimates have been rounded representing further uncertainty in individual values.

It is important to note that this cost per metric ton does not represent an expected market price value for carbon mitigation associated with these measures. In addition, the single year (2030) values and the estimates that encompass 2021 to 2030 do not capture the fuel savings or GHG reductions associated with the full economic lifetime of measures that have been implemented by 2030, but whose impacts extend beyond 2030. The estimates also do not capture the climate or health benefits of the GHG mitigation measures. Table 10 also notes the measures for which sources other than the PATHWAYS model were used to develop estimates of the cost per metric ton. The estimates in the table indicate that the relative cost of the measures is reasonably consistent across the different measures of cost per metric ton. Measures that are relatively less costly using the 2030 cost per metric ton are also less costly using the cost per metric ton based on the period 2021 to 2030. However, for several measures the sign of the estimate differs, such that in 2030 the measure has a positive cost while there is a negative cost for the period 2021 to 2030. This difference in sign occurs because the measure includes increasingly costly investments toward the end of the period examined. By examining only 2030, the lower cost components of the measure that occur in earlier years are omitted, resulting in a higher cost estimate for 2030 alone.

TABLE 10: ESTIMATED COST PER METRIC TON OF MEASURES CONSIDERED IN THE 2017 SCOPING PLAN DEVELOPMENT AND AVERAGED FROM 2021 THROUGH 2030

Important: As individual measures are designed and implemented they will be subject to further evaluation and refinement and public review, which may result in different findings than presented below. The ranges are estimates that represent current assumptions of how programs may be implemented and may vary greatly depending on the design, implementation, and performance of the policies and measures. Measures in bold text are included in the Scoping Plan.

Measure	Cost/metric ton in 2030*	Cost/metric ton 2021-2030**
50 percent Renewables Portfolio Standard (RPS) ^a	\$175	\$100 to \$200
Mobile Sources CFT and Freight ^b	<\$50	<\$50
Liquid Biofuels (18 percent Carbon Intensity Reduction Target for LCFS) ^c	\$150	\$100 to \$200
Short-Lived Climate Pollutant Strategy ^d	\$25	\$25
2x additional achievable energy efficiency in the 2015 IEPR ^f	-\$350	-\$300 to -\$200
10 percent incremental RPS and additional 10 GW behind-the-meter solar PV ^a	\$350	\$250 to \$450
Liquid Biofuels (25 percent Carbon Intensity Reduction Target for LCFS and a Low-Emission Diesel Standard) ^b	\$900	\$550 to \$975
20 percent Refinery ^d	\$100	\$50 to \$100
30 percent Refinery ^d	\$300	\$175 to \$325
25 percent Industry ^d	\$200	\$150 to \$275
25 percent Oil and Gas ^d	\$125	\$100 to \$175
5 percent Increased Utilization of renewable natural gas - core and non-core ^e	\$1500	\$1350 to \$3000
Mobile Source Strategy (CFT) with Increased ZEVs in South Coast & additional reductions in VMT and energy demand & early retirement of LDVs with more efficient LDVs ^b	\$100	<\$50
2.5x additional achievable energy efficiency in the 2015 IEPR, electrification of buildings (heat pumps & res. electric stoves) and early retirement of HVAC ^f	\$75	-\$120 to -\$70

- * Where enhancements have been made to a measure or policy, the cost per metric ton are incremental to the original measure. For example, the cost per metric ton for the 25 percent LCFS are incremental to the cost per metric ton for the 18 percent LCFS.
- ** The lower values use a cost discount rate of 10 percent and cumulative emissions for the period 2021 to 2030. The higher values discount both costs and emissions using a discount rate of 10 percent.
- a Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text.
- b Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text.
- c Liquid biofuel values are calculated as the average unsubsidized cost of biofuels supplied above that of an equivalent volume of fossil fuels. These values do not reflect impacts from other biofuel policies, such as the Renewable Fuel Standard or production tax credits, that are partially supported by fuel purchasers/taxpayers outside of California. Therefore, these values do not represent LCFS program costs or potential LCFS credit prices.
- d See Appendix D
- e Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text.
- f Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text. The cost per metric ton does not represent the results of the CPUC's or CEC's standard cost-effectiveness evaluation tests

Health Analyses

Climate mitigation will result in both environmental and health benefits. This section presents information about the potential health benefits of the Scoping Plan. The impacts are primarily from reduced particulate matter pollution, reduced toxics pollution (both diesel combustion particles and other toxic pollutants), and the health benefits of increased physical activity that will result from more active modes of transportation such as walking and biking in lieu of driving. CARB is using the AB 197 air quality estimates in Table 5 as a proxy to understand the potential health impacts from the Scoping Plan. There is uncertainty in the air quality estimates and that is carried through to the health impacts evaluation presented here. In the future, CARB will be working to explore how to better integrate health analysis and health considerations in the design and implementation of climate programs.

Because the health endpoints of each of these benefits is different (e.g., fewer incidences of premature mortality, lower cancer risk, and fewer incidences of heart disease), the methodologies for estimating the benefits differ. Further, the methodologies are statistical estimates of adverse health outcomes aggregated to the statewide level. Therefore, this information should only be used to understand the relative health benefits of the various strategies and should not be taken as an absolute estimate of the health outcomes of the Scoping Plan statewide, or within a specific community. The latter is a function of the unique exposure to air pollutants within each community and each individual's choice of more active transport modes that increase physical activity.

The estimates of health benefits in this section do not include any potential avoided adverse health impacts associated with a reduction in global climate change. While we recognize that mitigating climate change will, for example, prevent atmospheric temperature rise, thereby preventing increases in ozone in California, which will result in fewer breathing problems, the connection is difficult to estimate or model. Since it takes collective global action to mitigate climate change, the following analyses do not attempt to quantify the improved health outcomes from reducing or stopping the rise in global temperatures.

The estimated statewide health benefits of the Scoping Plan are dominated by reductions in particulate matter from mobile sources and wood burning and a switch to more active transport modes. In particular, the focus on the impacts of exposure to particulate matter from mobile sources is expected because this is a major cause of air pollution statewide. For this reason, the actions concerning mobile sources in the Scoping Plan were specifically developed with the goal of achieving health-based air quality standards by reducing criteria and toxics emissions as well as GHG emissions simultaneously. In addition, actions that support walkable communities not only result in reduced VMT and related GHG emissions, but promote active transport and increased physical activity that is strongly related to improved health.

Table 11 provides a summary of the total estimated health benefits from the relevant metrics for the Scoping Plan. The sections below summarize the methodologies used to estimate these benefits. More detail on how these estimates were calculated can be found in Appendix G. The air pollutant values used in estimating the health impacts are from Table 5 and all caveats in the estimation of the air quality impacts must be considered when reviewing the health impacts discussed below as the air pollutant values are likely overestimates based on assigned relationships to GHGs that may not be real.

Potential Health Impacts of Reductions in Particulate Matter Air Pollution

CARB relied on an U.S. EPA-approved methodology to estimate the health impacts of reducing air pollution by actions in the Scoping Plan. This methodology relies on an incidents-per-ton factor to quantify the health benefits of directly emitted (diesel particles and wood smoke) and secondary $PM_{2.5}$ formed from oxides of nitrogen from reductions due to regulatory controls. It is similar in concept to the methodology developed by the U.S. EPA for comparable estimations¹⁰¹, but uses California air basin specific relationships between emissions and air quality. The basis of the methodology is an approximately linear relationship between changes in $PM_{2.5}$ emissions and estimated changes in health outcomes. In this methodology, the number of premature deaths is estimated by multiplying emissions by the incidents-per-ton scaling factor. The factors are derived from studies that correlate the number of incidents (premature deaths, hospitalizations, emergency room visits) associated with exposure to $PM_{2.5}$.

¹⁰¹ Fann, N., Fulcher, C.M., & Hubbell, B.J. (2009) The influence of location, source, and emission type in estimates of the human health benefits of reducing a ton of air pollution. (2009) *Air Quality, Atmosphere & Health* 2(3), 169–176

Potential Health Impacts of Reductions in Toxic Air Pollution

A number of factors complicate any attempt to evaluate the health benefits of reducing exposure to toxic air pollution. First, there are hundreds of individual chemicals of concern with widely varying health effects and potencies. Therefore, a single metric is of limited value in capturing the range of potential toxics benefits. Furthermore, unlike the criteria pollutants whose impacts are generally measured on regional scales, toxics pose concern for both near-source impacts and larger-scale photochemical transformations and transport. Finally, the accepted scientific understanding for cancer risk is that there is usually no safe threshold for exposures to carcinogens. Therefore, cancer risks are usually expressed as “chances per million” of contracting cancer over a (70-year) lifetime exposure (in Table 11 lifetime exposure is provided in the far right column).

In light of these complexities, CARB relied on the most recent National Air Toxics Assessment (NATA) conducted by the U.S. EPA.¹⁰² The NATA 2011 models the potential risks from breathing emissions of approximately 180 toxic air pollutants across the country. Modeled cancer risk results are available by census tract. The NATA data cover industrial facilities, mobile sources (on-road and off-road), small area-wide sources, and more. CARB multiplied the NATA “cancer risk-per-million” values by census tract by the census tract’s population, in order to estimate a population-weighted metric that could be aggregated to the statewide level. This statistic should not be construed as actual real-world cancers (due to the many uncertainties in estimating the real-world levels of risk). Next, CARB applied the percent reductions in emissions due to Scoping Plan actions, in order to obtain an estimate of the “avoided incidence” of statistical lifetime cancers attributable to implementation of the Scoping Plan. Again, the “avoided incidence” is a construct designed to provide a useful statistical metric for comparative purposes among scenarios. It should not be construed to be a real-world parameter.

Potential Health Impacts of Active Transportation

High levels of active transportation have been linked to improved health and reduced premature mortality by increasing daily physical activity, representing a major direct co-benefit of using active transportation as a strategy to reduce GHG emissions. The benefits of physical activity can be very large. Individuals who are active for approximately 12 minutes a day have a 20 percent lower risk of dying early than those who are active for just 5 minutes a day and those who are active an hour a day, have close to a 40 percent lower risk of premature death.¹⁰³

The Scoping Plan includes reductions in VMT, which can be achieved in a number of ways, including increased active transportation. To estimate the potential health benefits of active transport, CARB staff reviewed work done by the California Department of Public Health (CDPH) concerning the potential health benefits associated with the Caltrans Strategic Management Plan. In this Management Plan, Caltrans set a target for increasing the adoption of active transportation, aiming for a doubling of walking and a tripling of bicycle trips by 2020 compared to 2010. While this plan itself is not part of the Scoping Plan, it helps provide a sense of the magnitude of health benefits associated with increased active transportation.

CDPH performed a risk assessment to compare the number of premature deaths due to physical inactivity and traffic injuries in the baseline year of 2010 to the year 2020, assuming that Caltrans’ walking and bicycling mode share targets were met.¹⁰⁴ CDPH’s methodology has been documented in a publicly available technical manual¹⁰⁵ and the model has appeared in many peer-reviewed research articles.¹⁰⁶ It has been in development

102 U.S. Environmental Protection Agency (2011), National Air Toxics Assessment (NATA) 2011,

<https://www.epa.gov/national-air-toxics-assessment/2011-nata-assessment-results>

103 U.S. Department of Health and Human Services (2008) Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee Report, Washington, DC

104 Maizlish, N. (2016a) Increasing Walking, Cycling, and Transit: Improving Californians’ Health, Saving costs, and Reducing Greenhouse Gases. Office of Health Equity, California Department of Public Health. <https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/Maizlish-2016-Increasing-Walking-Cycling-Transit-Technical-Report-rev8-17-ADA.pdf>

105 Maizlish, N. (2016b) Integrated Transport and Health Impact Model (ITHIM): A Guide to Operation, Calibration and Integration with Travel Demand Models. California Spreadsheet Version December 12, 2016.

106 Gotschi, T., Tainio, M., Maizlish, N., Schwanen, T., Goodman, A., & Woodcock, J. (2015). Contrasts in active transport behaviour across four countries: how do they translate into public health benefits? *Preventative Medicine*, 74, 42-48. doi:10.1016/j.ypmed.2015.02.009

Maizlish, N., Woodcock, J., Co, S., Ostro, B., Fanai, A., & Fairley, D. (2013). Health cobenefits and transportation-related reductions in greenhouse gas emissions in the San Francisco Bay area. *American journal of public health*, 103(4), 703-709. doi:10.2105/ajph.2012.300939

Whitfield, G. P., Meehan, L. A., Maizlish, N., & Wendel, A. M. (2016). The Integrated Transport and Health Impact Modeling

since 2009, and a California-specific version was released with a recent update in November 2016.¹⁰⁷

CDPH estimated that 2,100 premature deaths annually would be avoided if Californians met the Management Plan's 2020 targets were met by Californians compared to 2010 travel patterns. A recent paper by Dr. Maizlish et al¹⁰⁸ quantified the health co-benefits of the preferred Sustainable Communities Strategies scenarios (compared to the 2010 baseline travel pattern) for the major Metropolitan Planning Organizations using the same methodology and found that 940 deaths annually would be avoided. For both analyses, there were significant reductions in cause-specific premature mortality due to increased physical activity, which was slightly counteracted by a much smaller increase in fatal traffic injuries due to the increased walking and bicycling. When taken together, the health benefit of increasing active transportation greatly outweighed the increased mortality from road traffic collisions. The Scoping Plan goals related to active transportation are more aggressive than those in both the Maizlish et al. 2017 publication and the analysis by CDPH for the Management Plan. Therefore, CARB staff used the CDPH estimate of approximately 2,100 fewer premature deaths from the Management Plan as a lower bound of what could be realized through implementation of the VMT reductions and active transport goals called for in the Scoping Plan Scenario.

TABLE 11: SUMMARY OF RANGES OF ESTIMATED HEALTH IMPACTS FOR THE SCOPING PLAN SCENARIO IN 2030

	Fewer Premature Deaths	Fewer Hospitalizations (all)	Fewer ER visits	Fewer cancers *
Diesel PM	~60-91	~9-14	~25-38	
Secondary PM	~76-120	~11-17	~33-50	
Toxics				~21-61
Wood smoke	~1000	~ 148	~ 418	
Active Transport**	>2100			
Total	~3300	~180	~500	~21-61
<p>* This metric should not be construed as actual real-world cancer cases. It is intended to be a comparative metric, based on the NATA estimates of lifetime cancer risk (chances-per-million over a 70 year life-time exposure) by census tract multiplied by the tract population.</p> <p>** Reduction in premature death assumes meeting the CSMP 2020 mode shift target.</p>				

Note: The numbers in the table represent individual avoided incidences.

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- Tool in Nashville, Tennessee, USA: Implementation Steps and Lessons Learned. Journal of transport & health, 3. doi:10.1016/j.jth.2016.06.009
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- Woodcock, J., Givoni, M., & Morgan, A. S. (2013). Health impact modelling of active travel visions for England and Wales using an Integrated Transport and Health Impact Modelling Tool (ITHIM). PLoS One, 8(1), e51462. doi:10.1371/journal.pone.0051462
- Woodcock, J., Tainio, M., Cheshire, J., O'Brien, O., & Goodman, A. (2014). Health effects of the London bicycle sharing system: health impact modelling study. BMJ (Clinical research ed.), 348, g425. doi:10.1136/bmj.g425
- 107 Woodcock, J. Maizlish, N. (2016). ITHIM: Integrated Transport & Health Impact Modelling, California Version, November 11, 2016. Original citation: Woodcock J, Givoni M, Morgan AS. Health Impact Modelling of Active Travel Visions for England and Wales Using an Integrated Transport and Health Impact Modelling Tool (ITHIM). PLoS One. 2013;8(1):e51462.
- 108 Maizlish N, Linesch N, & Woodcock J. (2017) Health and greenhouse gas mitigation benefits of ambitious expansion of cycling, walking, and transit in California. Journal of Transport and Health. ; doi: 10.1016/j.jth.2017.04.011

Future Health Activities

As Table 11 shows, the Scoping Plan measures would have significant potential positive health outcomes. The integrated nature of the strategies to reduce emissions of GHGs and criteria and toxics emissions could provide multiple benefits. Actions to reduce black carbon from wood smoke are reducing the same particles that lead to premature mortality. Reductions in fossil combustion will not only reduce GHG emissions, but also toxics emissions. Finally, reducing VMT with strategies that provide opportunities for people to switch to active transport modes can have very large health benefits resulting from increased physical activity.

In recognition of the potential for significant positive health benefits of the Scoping Plan, CARB is initiating a process to better understand how to integrate health analysis broadly into the design and implementation of our climate change programs with the goal of maximizing the health benefits. Although health impact assessments have been used to inform CARB's policymaking, these analyses have not been consistently integrated into the general up-front design of CARB programs. To begin the effort to increase health benefits from climate change mitigation policies, CARB will convene a public meeting in Spring 2018 to solicit input on how best to incorporate health analyses into our policy development. CARB staff will seek appropriate tools for these analyses and will assemble a team of academic advisors to provide input on the latest developments in methods and data sources.

Economic Analyses

The following section outlines the economic impact of the Scoping Plan relative to the business-as-usual Reference Scenario. Additional detail on the economic analysis, including modeling details and the estimated economic impact of alternative scenarios is presented in Appendix E.

The Scoping Plan outlines a path to achieve the SB 32 target that requires less reliance on fossil fuels and increased investment in low carbon fuels and clean energy technologies. Through this shift, California can lead the world in developing the technologies needed to reduce the global risks of climate change. This builds on California's current successes of reducing GHG emissions while also developing a cleaner, resilient economy that uses less energy and generates less pollution. Innovation in low-carbon technologies will continue to open growth opportunities for investors and businesses in California. As modeled, the analysis in this Scoping Plan suggests that the costs of transitioning to this lower carbon economy are small, even without counting the potential opportunities for new industries and innovation in California. Under the Scoping Plan, the California economy, employment, and personal income will continue to grow as California businesses and consumers make clean energy investments and improve efficiency and productivity to reduce energy costs.

In 2030, the California economy is projected to grow to \$3.4 trillion, an average growth rate of 2.2 percent per year from 2021 to 2030. It is not anticipated that implementation of the Scoping Plan will change the growth of annual State Gross Domestic Product (GDP). Further, this growth in GDP will occur under the entire projected range of Cap-and-Trade Program allowance prices. Based on this analysis, in 2030 the California economy will take only three months longer to grow to the GDP estimated in the absence of the Scoping Plan—referred to as the Reference Scenario. The impact of the Scoping Plan on job growth is also negligible, with employment less than one half of one percent smaller in 2030 compared to the Reference Scenario.

Additionally, reducing GHG emissions 40 percent below 1990 levels under the Scoping Plan will lead to avoided social damages from climate change on the order of \$1.9 to \$11.2 billion, as estimated using the SC-CO₂ and SC-CH₄, as well as additional potential savings from reductions in air pollution and petroleum dependence. These impacts are not accounted for in this economic analysis. The estimated impact to California households is also modest in 2030. In 2030, the average annual household impact of the Scoping Plan ranges from \$115 to \$280, depending on the price of reductions under the Cap-and-Trade Program.¹⁰⁹ Estimated personal income in California is also relatively unchanged by the implementation of the Scoping Plan.

¹⁰⁹ Household projections are obtained from the California Department of Finance and were accessed on March 16, 2017 at: <http://www.dof.ca.gov/Forecasting/Demographics/projections/>.

Overview of Economic Modeling

Two models are used to estimate the economic impact of the Scoping Plan and California's continued clean energy transition: (1) the California PATHWAYS model, and (2) the Regional Economic Models, Inc. (REMI) Policy Insight Plus model. The California PATHWAYS model estimates the direct costs and GHG emissions reductions of implementing the prescriptive (or non-Cap-and-Trade) measures in the Scoping Plan relative to the BAU scenario.¹¹⁰ Direct costs are the sum of the incremental changes in capital expenditures and fuel expenditures, including fuel savings for reduced energy use from efficiency measures. In most cases, reducing GHG emissions requires the use of more expensive equipment that can be operated using less fuel. In the Scoping Plan, the prescriptive measures modeled in PATHWAYS account for a portion of the GHG reductions required to meet the 2030 target. The remaining reductions are delivered through the Cap-and-Trade Program. The direct costs associated with the Cap-and-Trade Program are calculated outside of PATHWAYS based on an assumed range of Cap-and-Trade allowance prices from 2021 through 2030.

To estimate the future costs of the Scoping Plan, this economic analysis necessarily creates a hypothetical future California that is essentially identical to today, adjusted for currently existing climate policy as well as projected economic and population growth through 2030. The analysis cannot predict the types of innovation that will create efficiencies nor can it fully account for the significant economic benefits associated with reducing emissions. Rather, the economic modeling is conducted by estimating incremental capital and clean fuel costs of measures and assigning those costs to certain sectors within this hypothetical future.

The macroeconomic impacts of the Scoping Plan on the California economy are modeled using the REMI model with output from California PATHWAYS and estimated Cap-and-Trade Program costs as inputs. Additional methodological detail is presented in Appendix E.¹¹¹

Estimated Cost of Prescriptive Measures

As described above, the Scoping Plan combines new measures addressing legislative mandates and the extension of existing measures, including a comprehensive cap on overall GHG emissions from the State's largest sources of pollution. The PATHWAYS model calculates costs and GHG emissions reductions associated with the prescriptive measures in the Scoping Plan. Changes in energy use and capital investment are calculated in PATHWAYS and represent the estimated cost of achieving an estimated 50 to 70 percent of the cumulative GHG reductions required to reach the SB 32 target between 2021 and 2030. The Cap-and-Trade Program delivers any remaining reductions, as shown in Figure 8.

Table 12 outlines the cost of prescriptive measures by sector in 2030, compared to the Reference Scenario, as calculated in PATHWAYS. Estimated capital costs of equipment are leveled over the life of the equipment using a 10 percent discount rate and fuel costs are calculated on an annual basis.¹¹² The costs in Table 12 are disaggregated into capital costs and fuel costs, which includes the varying costs of gasoline, diesel, biofuels, natural gas, electricity and other fuels.¹¹³ Table 12 assumes that all prescriptive measures deliver anticipated GHG reductions, and does not include any uncertainty in GHG reductions or cost.¹¹⁴ The impact of uncertainty in GHG reductions is explored in more detail in Appendices E, which include additional detail on measure, cost, and Reference Scenario uncertainty.

The prescriptive measures result in incremental capital investments of \$6.7 billion per year in 2030, but these annual capital costs are nearly offset by annual fuel savings of \$6.6 billion in 2030. The incremental net cost of prescriptive measures in the Scoping Plan is estimated at \$100 million in 2030, which represents 0.03 percent of the projected California economy in 2030. The residential and transportation sectors are anticipated to see net savings in 2030 as fuel savings for these areas vastly outweigh annual capital investment. Several sectors will see a net cost increase from implementation of the prescriptive measures. The industrial sector sees higher fuel costs relative to the Reference Scenario. In the agriculture sector, capital expenditures are due to investments in more efficient lighting and the mitigation of agricultural methane and nitrogen oxides. Agricultural fuel costs increase due to higher electricity and liquid biofuel costs.

110 The PATHWAYS modeling is described in Chapter 2, and additional detail is presented in Appendix D.

111 Additional modeling details are available at the REMI PI+ webpage: <http://www.remi.com/products/pi>.

112 PATHWAYS costs are calculated in real \$2012. For this analysis, all costs are reported in \$2015. The PATHWAYS costs are inflated using Bureau of Economic Analysis (BEA) data available at: <https://www.bea.gov/iTable/iTable.cfm?ReqID=9&reqid=9&step=1&isuri=1&903=4>.

113 Additional information on the fuels included in PATHWAYS is available at: www.arb.ca.gov/cc/scopingplan/meetings/1142016/e3pathways.pdf.

114 More information on the inputs to the California PATHWAYS model is available at: www.arb.ca.gov/cc/scopingplan/scoping_plan_scenario_description2016-12-01.pdf.

TABLE 12: CHANGE IN PATHWAYS SECTOR COSTS IN 2030 RELATIVE TO THE REFERENCE SCENARIO (BILLION \$2015)¹¹⁵

End Use Sector ¹¹⁶	Levelized Capital Cost	Fuel Cost	Total Annual Cost
Residential	\$0.1	-\$1.2	-\$1.1
Commercial	\$1.8	-\$1.8	\$0.1
Transportation	\$3.5	-\$3.8	-\$0.3
Industrial	\$0.8	\$0.3	\$0.5
Oil and Gas Extraction	\$0.0	\$0.0	\$0.1
Petroleum Refining	\$0.0	\$0.0	\$0.0
Agriculture	\$0.3	\$0.2	\$0.5
TCU (Transportation Communications and Utilities)	\$0.1	\$0.1	\$0.2
Total	\$6.7	-\$6.6	\$0.1

Note: Table values may not add due to rounding.

Estimated Cost of the Cap-and-Trade Program

The direct cost of achieving GHG reductions through the Cap-and-Trade Program is estimated outside of PATHWAYS. The Cap-and-Trade Program sets an economy-wide GHG emissions cap and gives firms the flexibility to choose the lowest-cost approach to reduce emissions. As with the prescriptive measures, the direct costs of any single specific GHG reduction activity under the Cap-and-Trade Program is subject to a large degree of uncertainty. However, as Cap-and-Trade allows covered entities to pursue the reduction options that emerge as the most efficient, overall abatement costs can be bounded by the allowance price. Covered entities should pursue reduction actions with costs less than or equal to the allowance price. An upper bound on the compliance costs under the Cap-and-Trade Program can therefore be estimated by multiplying the range of anticipated allowance prices by the anticipated GHG reductions needed (in conjunction with the reductions achieved through the prescriptive measures) to achieve the SB 32 target.

A large number of factors influence the allowance price, including the ease of substituting lower carbon production methods, consumer price response, the pace of technological progress, and impacts to the price of fuel. Other policy factors that also affect the allowance price include the use of auction proceeds from the sale of State-owned allowances and linkage with other jurisdictions.

Flexibility allows the Cap-and-Trade allowance price to adjust to changes in supply and demand while a firm cap ensures GHG reductions are achieved. This analysis includes a range of allowance prices bounded at the low end by the Cap-and-Trade auction floor price (C+T Floor Price) which represents the minimum sales price for allowances sold at auction and the Allowance Price Containment Reserve Price (C+T Reserve Price), which represents the price at which an additional pool of allowances will be made available to ensure entities can comply with the Cap-and-Trade Program and is the highest anticipated price under the Program. Table 13 outlines the projected allowance prices used in this analysis.¹¹⁷

¹¹⁵ PATHWAYS costs reported in \$2012 are inflated to \$2015 using the Bureau of Economic Analysis (BEA) data available at: <https://www.bea.gov/iTable/iTable.cfm?ReqID=9#reqid=9&step=1&isuri=1&903=4>.

¹¹⁶ Information on the end use sectors are available in the California PATHWAYS documentation available at: www.arb.ca.gov/cc/scopingplan/scopingplan.htm.

¹¹⁷ The Cap-and-Trade allowance price range is based on the Cap-and-Trade Regulation approved by the Office of Administrative

TABLE 13: ESTIMATED RANGE OF CAP-AND-TRADE ALLOWANCE PRICE 2021–2030*

(\$2015)	2021	2025	2030
C+T Floor Price	\$16.2	\$19.7	\$25.2
C+T Reserve Price	\$72.9	\$76.4	\$81.9

* Based on current regulation in effect October 1, 2017

Uncertainty in the GHG reduction potential of prescriptive measures in the Scoping Plan can affect the cost of achieving the 2030 target. The aggregate emissions cap of the Cap-and-Trade Program ensures that the 2030 target will be met—irrespective of the GHG emissions realized through prescriptive measures. If GHG reductions anticipated under prescriptive measures do not materialize, the Cap-and-Trade Program will be responsible for a larger share of emissions reductions. Under that scenario, the demand for Cap-and-Trade allowances may rise, resulting in an increase in allowance price. While the Cap-and-Trade allowance price may rise, it is highly unlikely that it will rise above the C+T Reserve price, given the program design. If prescriptive measures deliver anticipated GHG reductions, demand for allowances will be low, depressing the price of allowances. However, the C+T Floor Price represents the lowest price at which allowances can be sold at auction.

Table 14 presents the estimated direct cost estimates for GHG reductions achieved through the Cap-and-Trade Program in 2030. These costs represent the lower and upper bounds of the cost of reducing GHG emissions to achieve the SB 32 target under the Scoping Plan. The estimated direct costs range from \$1.6 to \$5.1 billion dollars (in \$2015), depending on the allowance price in 2030. This range highlights the allowance price uncertainty that is a trade-off to the GHG reduction certainty provided by the Cap-and-Trade Program. The estimated cost of GHG reductions is calculated by multiplying the allowance price by the GHG emissions reductions required to achieve the SB 32 target.

Sensitivity Analysis

In addition to uncertainty in the Cap-and-Trade allowance price and uncertainty in the GHG reductions achieved through the prescriptive measures, there is uncertainty in the GHG emissions that will occur under the Reference Scenario, as presented in Figure 6. There is also uncertainty in costs embedded within the Reference Scenario including the price of oil, other energy costs, and technology costs.

The PATHWAYS incremental cost results are also sensitive to the fossil fuel price assumptions. Altering the fuel price trajectory in the Reference Scenario directly impacts the incremental cost of achieving GHG reductions in the Scoping Plan, as the costs of the Scoping Plan are relative to the Reference Scenario.¹¹⁸

The PATHWAYS scenarios use fossil fuel price projections from the Annual Energy Outlook (AEO) 2015 reference case.¹¹⁹ To estimate the impact of changes in future fuel prices on the estimated incremental cost of the Scoping Plan two sensitivities were conducted. In the low fuel price sensitivity, the AEO low oil and natural gas price case is used to project the future cost of fuels in the Reference Scenario. The cost of the Scoping Plan, relative to the Reference Scenario, increases under these conditions, since fuel savings are less valuable when fuel prices are low. A second sensitivity shows that high future oil and natural gas prices (as projected in the AEO high oil price case) reduce the net cost of the Scoping Plan, relative to the Reference Scenario. This is because avoided fuel savings are more valuable when fuel prices are high. Table 14 outlines the costs and savings from the Scoping Plan (both prescriptive measures and cap-and-trade) under the high and low fuel price sensitivities.

The price of oil and natural gas affects the value of fuel savings (as presented in Table 12), which are estimated to be significant using AEO reference oil and natural gas prices. Under the low fuel price sensitivity,

Law on September 18, 2017. Documentation is available at: www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm

118 In addition to the fuel cost sensitivities presented in this section, Appendix E includes an uncertainty analysis of the Scoping Plan Scenario and alternatives. This analysis addresses uncertainty in the Reference Scenario emissions, GHG reductions from each measure, as well as capital and fuel costs.

119 The high and low fuel price sensitivity ranges are derived from differences between the AEO 2016 High Oil Price or Low Oil Price forecast and the AEO 2016 reference case, and are applied as ratios to the base case fuel price assumptions (which are based on the AEO 2015 report). The AEO 2015 report is available at: [http://www.eia.gov/outlooks/aeo/pdf/0383\(2015\).pdf](http://www.eia.gov/outlooks/aeo/pdf/0383(2015).pdf) and the AEO 2016 report is available for download at: [http://www.eia.gov/outlooks/aeo/pdf/0383\(2016\).pdf](http://www.eia.gov/outlooks/aeo/pdf/0383(2016).pdf).

the net incremental cost of prescriptive measures is \$2.9 billion in 2030. Under the high fuel price sensitivity, the prescriptive measures result in net savings of \$4.9 billion in 2030. Table 14 also shows that these price uncertainties are captured within the analyzed range of allowance prices. As described above, changes in fuel prices may affect the price of Cap-and-Trade allowances, but the price is highly unlikely to go outside the range of prices bounded by the C+T Floor Price and C+T Reserve Price. The final column in Table 14 presents the estimated direct cost of the Scoping Plan, including both the prescriptive measures and a range of estimated costs to achieve GHG reductions under the Cap-and-Trade Program for varying projections of future fuel prices. The total cost, reflecting fuel and allowance price uncertainty, ranges from an annual savings to California of \$3.3 billion to an annual cost of \$8.0 billion in 2030. The net climate benefits, as estimated by the SC-CO₂ and SC-CH₄, outweigh these direct costs.¹²⁰

TABLE 14: ESTIMATES OF DIRECT COST AND CLIMATE BENEFITS IN 2030 RELATIVE TO THE REFERENCE SCENARIO AND INCLUDING FUEL PRICE SENSITIVITY (BILLION \$2015)

Scenario	Prescriptive Measures	C+T Floor Price	C+T Reserve Price	2030 Total Cost
Scoping Plan	\$0.1	\$1.6	\$5.1	\$1.7 to \$5.2
Low Fuel Price Sensitivity	\$2.9	\$1.6	\$5.1	\$4.5 to \$8.0
High Fuel Price Sensitivity	-\$4.9	\$1.6	\$5.1	-\$3.3 to -\$0.2

Fuel price sensitivity is directly modeled in PATHWAYS, resulting in a range of impacts from prescriptive measures. The range of costs labeled "2030 Total Cost" includes the cost of prescriptive measures estimated in PATHWAYS and the impact of the Cap and-Trade Program calculated at the C+T Floor Price (the lower bounds) and the C+T Reserve Price (the upper bounds). The social cost of GHGs estimated range in 2030 is \$1.9 to \$11.2 billion.

Macroeconomic Impacts

The macroeconomic impacts of the Scoping Plan are estimated using the REMI model. Annual capital and fuel costs (for example, the costs in Table 12) are estimated using PATHWAYS and input into the REMI model to estimate the impact of the Scoping Plan on the California economy each year relative to GDP, which is often used as a proxy for economic growth, as well as employment, personal income, and changes in output by sector and consumer spending. Table 15 presents key macroeconomic impacts of implementing the Scoping Plan, based on the range of anticipated allowance prices. In 2030, under the Scoping Plan, growth across the indicators is about one-half of one percent less than the Reference Scenario. The results in Table 15 include not only the estimated direct cost of the Cap-and-Trade Program, but also distribution of allowance value from the auction of Cap-and-Trade allowances to California and consumers. See Appendix E for more detail on the modeling of the return of allowance value under the Cap-and-Trade Program in REMI.

The Cap-and-Trade Program is modeled in REMI as an increase in production cost to sectors based on estimated future GHG emissions and anticipated free allowance allocation. If a sector is expected to receive free allocation of allowances, the value of those free allowances is not modeled as a cost in REMI. The analysis does include the estimated benefit to sectors due to the proceeds from the auction of cap-and-trade allowances and assumes that each year \$2 billion of proceeds from the auction of State-owned cap-and-trade allowances are distributed to the economic sectors currently receiving GGRF appropriations. These funds work to achieve further GHG reductions in California, lower the cost to businesses of reducing GHG emissions and protect disadvantaged communities. Any auction proceeds remaining after the distribution of \$2 billion through GGRF sectors are distributed evenly to consumers in California as a dividend. The estimated costs in Table 15 include the cost of the GHG reductions to sectors, as well as the benefit to those sectors when allowance proceeds are returned through the GGRF and as a dividend to consumers, as detailed in Appendix E.

¹²⁰ Climate benefits are estimated using the Social Cost of Carbon in 2030 across the range of discount rates from 2.5 to 5 percent. All values are reported in \$2015. Additional information on the Social Cost of Carbon is available from the National Academies of Sciences, Engineering, and Medicine at: <https://www.nap.edu/catalog/24651/valuing-climate-damages-updating-estimation-of-the-social-cost-of>.

TABLE 15: MACROECONOMIC INDICATORS IN 2030 UNDER BASE FUEL PRICE ASSUMPTIONS

	Reference Scenario (2030)	Scoping Plan (2030)	Percentage Change Relative to Reference Scenario
California GDP (Billion \$2015)	\$3,439	\$3,430 to \$3,420	-0.3 percent to -0.6 percent
Employment (Thousand Jobs)	23,522	23,478 to 23,441	-0.2 percent to -0.3 percent
Personal Income (Billion \$2015)	\$3,010	\$3,006 to \$3,008	-0.1 percent to -0.1 percent

Table 15 was estimated using the REMI model. The range of costs for the Scoping Plan represents the impact of achieving the SB 32 target through prescriptive measures and the Cap-and-Trade Program at the C+T Floor Price (the lower bounds) and the C+T Reserve Price (the upper bounds).

It is important to put the results of Table 15 into context of the growing \$3.4 trillion California economy in 2030. As noted earlier, the economic analysis does not include avoided social damages and other potential savings from reductions in air pollution and petroleum dependency.

Determining employment changes as a result of policies is challenging to model, due to a range of uncertainties and global trends that will influence the California economy, regardless of implementation of the Scoping Plan. The global economy is seeing a shift toward automation and mechanization, which may lead to slowing of employment across some industries globally, irrespective of California's energy and low carbon investments. In California, employment is projected to reach 23.5 million jobs in 2030. In this analysis, implementing the Scoping Plan would slow the growth of employment by less than one-half of one percent in 2030.

Estimated personal income in California is relatively unchanged under the Scoping Plan relative to the Reference Scenario. Considering the uncertainty in the modeling, modest changes in the growth of personal income are not different from zero, which suggests that meeting the SB 32 target will not change the growth of personal income relative to the Reference Scenario.

When analyzing the estimated macroeconomic impacts, it is important to remember that a major substitution of electricity and capital away from fossil fuels is anticipated to have a very small effect on California GDP, employment, and personal income—less than one percent relative to the Reference Scenario in 2030. The economic impacts indicate that shifting money and investment away from fossil fuels and to clean energy is likely to have a negligible effect on the California economy. Additionally, it is certain that innovation will continue as new technologies are developed and implemented. While this analysis projects the costs and GHG reductions of current technologies over time, it does not capture the impact of new technologies that may shift the economy and California in unanticipated ways or benefits related to changes in air pollution and improvements to human health, avoided environmental damages, and positive impacts to natural and working lands. Thus, the results of this analysis very likely underestimate the benefits of shifting to a clean energy economy.

Consumer spending also shifts in response to implementation of the Scoping Plan relative to the Reference Scenario. As presented in Table 15, there is a negligible impact to consumer income, but small changes in income can alter the distribution of consumer spending among categories. In 2030, consumer spending is lower under the Scoping Plan than in the Reference Scenario across all analyzed allowance prices. Consumers spend less on fuels, electricity, natural gas, and capital as a result of measures in the Scoping Plan that reduce demand, increase efficiency, and drive technological innovations. The estimated impact to California households is also modest in 2030. The estimated cost to California households in 2030 ranges from \$115 to \$280, depending on the price of reductions under the Cap-and-Trade Program.¹²¹

The household impact is estimated using the per-household change in personal income as modeled in REMI and utilizing household estimates from the California Department of Finance. The household impact does not account for benefits from reduced climate impacts, health savings from reduced air pollution impacts, or lower petroleum dependence costs that might impact households. Additional details are presented in Appendix E.

As modeled, the household impact of the Scoping Plan comprises approximately one percent of average household expenditures in 2030. To ensure that vulnerable populations and low-income households are not

¹²¹ Household projections are obtained from the California Department of Finance and are available at:

<http://www.dof.ca.gov/Forecasting/Demographics/projections/>.

disproportionately affected by California's climate policy, CARB is taking steps to better quantify localized economic impacts and ensure that low-income households see tangible benefits from the Scoping Plan. Researchers at the University of California, Los Angeles (UCLA) are currently working on a retrospective analysis that will estimate the impacts across California communities of the implementation of AB 32, which will help identify areas of focus as 2030 measures are developed. The Cap-and-Trade Program will also continue to provide benefit to disadvantaged communities through the disbursement of GGRF funds.

The investments made in implementing the Scoping Plan will have long-term benefits and present significant opportunities for California investors and businesses, as upfront capital investments will result in long-term fuel and energy efficiency savings, the benefits of which will continue into the future. The California economy will continue to grow under the Scoping Plan, but it will grow more resilient, more sustainable, and will be well positioned to reap the long-term benefits of lower carbon investments.

Economic Modeling of Health Impacts

Health benefits associated with reductions in diesel particulate matter (DPM) and nitrogen oxides (NO_x) are monetized for inclusion in the macroeconomic modeling. The health benefits are estimated by quantifying the harmful future health effects that will be avoided by reducing human exposure to DPM and NO_x, as detailed in Appendix G, and monetized by estimating a health effect's economic value to society. As previously noted the health impacts are based on air quality benefits estimated in Table 6, which have important limitations and likely overestimate the impacts of the Scoping Plan. Additional detail on the economic modeling of health impacts, including the monetization methodology and modeling results for all Scoping Plan scenarios, is presented in Appendix E. Including the monetized health impacts in the REMI modeling has no discernible impact on the overall results. The impact of including the monetized health impacts is indiscernible relative to the impact of the Scoping Plan.

Estimating the Economic Impact on Disadvantaged Communities (DACs)

Implementing the Scoping Plan is estimated to have a small impact on the Statewide California economy through 2030. However, shifting from fossil fuels can disproportionately affect specific geographic regions whose local economies rely on fossil fuel intensive industries. These regions can also include vulnerable populations and disadvantaged communities who may be disproportionately impacted by poor air quality and climate.

The regional impacts of the Scoping Plan, including the impact to disadvantaged communities, are estimated using the REMI California County model, which represents the 58 counties and 160 sectors of the California economy. Utilizing the same inputs used for modeling the statewide impact of the Scoping Plan relative to the Reference Scenario, the California County model estimates how measures will affect employment, value added, and other economic indicators at the county level across the state.

The county-level REMI output is also used to estimate impacts on disadvantaged communities affected by the Scoping Plan by allocating county impacts proportional to their share of economic indicators unique to each census tract.¹²² These indicators include industry output, industry consumption by fuel category, personal consumption, and population. The overall impact on employment across regions is not significant and there is no discernible difference in the impact to employment in disadvantaged communities. There is also no discernible impact to wages in disadvantaged communities across regions in California. Additional details on the regional modeling, including the results for the Scoping Plan and alternatives, is presented in Appendix E.

In addition to the regional modeling conducted in this analysis, there are currently three research contracts underway at CARB to quantify the impact of California's climate policy on regions and disadvantaged communities throughout California. As mentioned above, researchers from UCLA are estimating the improvements in health outcomes associated with AB 32, with a focus on disadvantaged communities. This research will be informed by input from technical advisory committees including a group focused on environmental justice.

¹²² Census tracts are small geographic areas within greater metropolitan areas that usually have a population between 2,500 and 8,000 persons. More information on the composition of census tracts available here: https://www.census.gov/geo/reference/gtc/gtc_ct.html. Disadvantaged census tracts are identified using CalEnviroScreen 2.0. Additional information is available at: <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-version-20>.

There are also two studies currently underway to quantify the impact of GGRF funds. A UCLA contract focuses on quantifying jobs supported by GGRF funds in California, while a University of California, Berkeley contract is constructing methodologies to assess the co-benefits of GGRF projects across California. These research efforts will provide a regional analysis of the impact of and benefits to specific communities and sectors to ensure that all Californians see economic benefits, in addition to clean air benefits, from the implementing the Scoping Plan.

Public Health

Many measures to reduce GHG emissions also have significant health co-benefits that can address climate change and improve the health and well-being of all populations across the State. Climate change is already affecting the health of communities.¹²³ Climate-related health impacts can include increased heat illness and death, increases in air pollution-related exacerbation of cardiovascular and respiratory diseases, injury and loss of life due to severe storms and flooding, increased vector-borne and water-borne diseases, and stress and mental trauma due to extreme weather-related catastrophes.¹²⁴ The urgency of action to address the impacts already being felt from a changing climate and the threats in coming decades provides a unique opportunity for California's leadership in climate action to reduce GHG emissions and create healthy, equitable, and resilient communities where all people thrive. This section discusses the link between climate change and public health. It does not analyze the specific measures included in the strategy but provides context for assessing the potential measures and scenarios.

Achieving Health Equity through Climate Action

Many populations in California face *health inequities*, or unfair and unjust health differences between population groups that are systemic and avoidable.¹²⁵ Differences in environmental and socioeconomic determinants of health result in these health inequities. Those facing the greatest health inequities include low-income individuals and households, the very young and the very old, communities of color, and those who have been marginalized or discriminated against based on gender or race/ethnicity.¹²⁶ It is these very same populations, along with those suffering existing health conditions and certain populations of workers (e.g., outdoor workers), that climate change will most disproportionately impact.¹²⁷ The inequitable distribution of social, political, and economic power results in health inequities, while perpetuating systems (e.g., economic, transportation, land use, etc.) that drive GHG emissions. As a result, communities face inequitable living conditions. For example, low-income communities of color tend to live in more polluted areas and face climate change impacts that can compound and exacerbate existing sensitivities and vulnerabilities.^{128,129} Fair and healthy climate action requires that the inequities creating and intensifying community vulnerabilities be addressed. Living conditions and the forces that shape them, such as income, education, housing, transportation, environmental quality, and access to services, significantly drive the capacity for climate resilience. Thus, strategies such as alleviating poverty, increasing access to opportunity, improving living conditions, and reducing health and social inequities will result in more climate-resilient communities. In fact, there are already many “no-regret” climate mitigation and adaptation measures available (discussed below) that can reduce health burdens, increase community resilience, and address social inequities.¹³⁰ Focusing efforts to achieve health equity can thus lead to significant progress in addressing human-caused climate change.

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124 Ibid.

125 Whitehead, M. 1992. “The concepts and principles of equity and health.” *International Journal of Health Services* 22(3), 429–445.

126 California Department of Public Health (CDPH). 2015. The Portrait of Promise: The California Statewide Plan to Promote Health and Mental Health Equity. A Report to the Legislature and the People of California by the Office of Health Equity. Sacramento, CA: California Department of Public Health, Office of Health Equity.

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128 Ibid.

129 Rudolph, L. and S. Gould. 2015. “Climate change and health inequities: A framework for action.” *Annals of Global Health* 81:3, 432–444.

130 Watts N, Adger WN, Agnolucci P, et al. 2015. Health and climate change: policy responses to protect public health. *Lancet*: 386, 1861-1914

Potential Health Impacts of Climate Change Mitigation Measures

Socioeconomic Factors: Income, Poverty, and Wealth

Economic factors, such as income, poverty, and wealth, are collectively one of the largest determinants of health. As such, climate mitigation measures that yield economic benefits can improve population health significantly, especially if the economic benefits are directed to those most vulnerable and disadvantaged (including those living in poverty) who often face the most health challenges. From the poorest to richest ends of the income spectrum, higher income is associated with greater longevity in the United States.^{131,132,133} The gap in life expectancy between the richest 1 percent and poorest 1 percent of Americans was almost 15 years for men in 2014, and about 10 years for women.¹³⁴ Early death among those living in poverty is not a result of those with higher incomes having better access to quality health care.¹³⁵ Only about 10-20 percent of a person's health status is accounted for by health care (and 20-30 percent attributed to genetics), while the remainder is attributed to the social determinants of health. These include environmental quality, social and economic circumstances, and the social, media, policy, economic, retail, and built environments— all of which in turn shape stress levels and behaviors, including smoking, diet, and exercise.^{136,137,138,139,140,141,142,143,144,145,146} In fact, where people live, work, learn, and play is often a stronger predictor of life expectancy than their genetic and biological makeup.¹⁴⁷ The World Health Organization's Commission on the Social Determinants of Health concluded that the poor health of poor people, and the social gradient in health, are caused by the unequal distribution of power, income, goods, and services resulting from poor social policies and programs, unfair economic arrangements, and bad politics.¹⁴⁸ Thus, improving the conditions of daily life and tackling the inequitable distribution of power, money, and resources can remedy inequitable health outcomes.¹⁴⁹ Simply put, the more evenly distributed the wealth, the healthier a society is.¹⁵⁰

The wealth-health gradient has significant implications for this Scoping Plan. State climate legislation and policies require prioritizing GHG reduction strategies that serve vulnerable populations and improve well-being for disadvantaged communities. As such, strategies that improve the financial security of communities facing disadvantages while reducing GHG emissions are win-win strategies. These include providing funds or services for GHG reduction programs (e.g., weatherization, energy efficiency, renewable energy, ZEVs, transit, housing, and others) to low-income individuals and households to help them reduce costs. Among the poorest 25 percent of people, per capita government expenditures are strongly associated with longer

131 Chetty, R., M. Stepner, S. Abraham, et al. 2016. "The Association Between Income and Life Expectancy in the United States, 2001–2014." JAMA Published online April 10, 2016. doi:10.1001/jama.2016.4226.

132 Marmot, M., S. Friel, R. Bell, et al. 2008. "Closing the gap in a generation: Health equity through action on the social determinants of health." The Lancet 372, 9650: 1661–1669.

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134 Chetty R, Stepner M, Abraham S, et al. 2016. The Association between Income and Life Expectancy in the United States, 2001–2014. JAMA. Published online April 10, 2016. doi:10.1001/jama.2016.4226

135 Ibid.

136 DHHS, Public Health Service. 1980. Ten leading causes of death in the United States. Atlanta, GA: Bureau of State Services.

137 McGinnis, J., and W. Foege. 1993. "Actual causes of death in the United States." JAMA 270(18), 2207–2212.

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141 Danaei, G. et al. 2009. "The preventable causes of death in the United States: Comparative risk assessment of dietary, lifestyle, and metabolic risk factors." PLoS Medicine 6(4), e1000058.

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143 Booske, B. et al. 2010. Different perspectives for assigning weights to determinants of health. County Health Rankings Working Paper. Madison, WI: University of Wisconsin Population Health Institute.

144 Stringhini, S. et al. 2010. "Association of socioeconomic position with health behaviors and mortality." JAMA 303(12), 1159–1166.

145 Thoits, P. 2010. "Stress and health: Major findings and policy implications." *Journal of Health and Social Behavior* 51 Suppl, S41–53.

146 McGovern, L., G. Miller and P. Hughes-Cromwick. 2014. "Health policy brief: The relative contribution of multiple determinants to health outcomes." Health Affairs

147 Iton, A. 2006. Tackling the root causes of health disparities through community capacity building. In: Hofrichter R, ed. Tackling Health Inequities Through Public Health Practice: A Handbook for Action. Washington, D.C., and Lansing, MI: National Association of County and City Health Officials and Ingham County Health Department; 116–136.

148 Marmot M, Friel S, Bell R, et al. 2008. Closing the gap in a generation: health equity through action on the social determinants of health. The Lancet , Volume 372 , Issue 9650, 1661 – 1669

149 Ibid.

150 Smith, R. 1996. "The big idea." British Medical Journal 312:April 20th, Editor's choice.

life spans.¹⁵¹ Successful strategies California has already implemented to assure the poor do not pay higher costs for societal GHG reductions include low-income energy discount programs, in combination with direct climate credits, and policies and programs that help Californians reduce electricity, natural gas, and gasoline consumption.¹⁵² More such strategies could be pursued. To tackle the inequitable distribution of power that leads to disparate health outcomes, agencies can first assure their hearing and decision-making processes provide opportunities for civic engagement so people facing health inequities can themselves participate in decision-making about solutions. Whether it is absolute poverty or relative deprivation that leads to poor health, investments and policies that both lift up the poor and reduce wealth disparities will address the multiple problems of climate change mitigation, adaptation, and health inequities.

Employment

Employment status impacts human health in many ways. Poor health outcomes of unemployment include premature death, self-rated ill-health (a strong predictor of poor health outcomes), and mental illness.^{153,154,155,156} Economic strain related to unemployment can impact mental health and trigger stress that is linked to other health conditions.^{157,158} Populations of color are overrepresented in the unemployment and under-employment ranks, which likely contributes to racial health inequities. In 2014, 14.7 percent of African-Americans, 12.1 percent of American Indians and Alaska Natives, and 9.8 percent of Latinos were unemployed, compared to 7.9 percent of Whites.¹⁵⁹ In addition to providing income, the work experience has health consequences. There is a *work status–health gradient* similar to the wealth–health gradient. Workers with lower occupational status have a higher risk of death,¹⁶⁰ increased blood pressure,¹⁶¹ and more heart attacks.^{162,163} Higher status workers often have a greater sense of autonomy, control over their work, and predictability, compared to lower status workers, whose lack of control and predictability translates to stress that shortens their lives.¹⁶⁴ Nonstandard working arrangements such as part-time, seasonal, shift, contract, or informal sector work have been linked to greater psychological distress and poorer physical health.^{165,166} Women are heavily overrepresented in nonstandard work, as are people of color and people with low levels of education.^{167,168}

The implementation of California’s climate change goals provides great opportunity to not only improve the habitability of the planet, but also to increase economic vitality, employ historically disadvantaged people

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- 152 Gattaciacca, J., C. Callahan, and J. R. DeShazo. 2016. Protecting the most vulnerable: A financial analysis of Cap-and-Trade’s impact on households in disadvantaged communities across California. UCLA Luskin School of Public Affairs: Los Angeles, CA. <http://innovation.luskin.ucla.edu/content/protecting-most-vulnerable>. Accessed April 22, 2016.
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- 154 Rogers, R., R. Hummer, and C. Nam. 2000. Living and Dying in the USA. Behavioral, health, and social differentials of adult mortality. New York, NY: Academic.
- 155 Ross, C. and J. Mirowsky. 1995. “Does employment affect health?” Journal of Health and Social Behavior 36(3):230–243.
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- 157 Price, R., D. Friedland, J. Choi, and R. Caplan. 1998. Job-loss and work transitions in a time of global economic change.
- 158 Price, R., J. Choi, and A. Vinokur. 2002. “Links in the chain of adversity following job loss: How financial strain and loss of personal control lead to depression, impaired functioning, and poor health.” Journal of Occupational Health Psychology 7(4), 302.
- 159 U.S. Census Bureau. 2014. American Community Survey 1-Year Estimates. http://www2.census.gov/programs-surveys/acs/summary_file/2014/data/. Last updated August 31, 2015. Accessed April 20, 2016.
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- 161 Colhoun, H., H. Hemingway, and N. Poulter. 1998. “Socio-economic status and blood pressure: An overview analysis.” Journal of Human Hypertension 12(2).
- 162 Möller, J., T. Theorell, U. De Faire, A. Ahlbom, and J. Hallqvist. 2005. “Work related stressful life events and the risk of myocardial infarction. Case-control and case-crossover analyses within the Stockholm heart epidemiology programme (SHEEP).” Journal of Epidemiology and Community Health 59(1), 23–30.
- 163 Burgard S, Lin K. 2013. Bad jobs, bad health? How work and working conditions contribute to health disparities. Am Behav Sci: 57(8).
- 164 Marmot, M., G. Rose, M. Shipley, and P. Hamilton. 1978. “Employment grade and coronary heart disease in British civil servants.” Journal of Epidemiology and Community Health 32(4), 244–249.
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- 166 Virtanen, M., M. Kivimäki, M. Joensuu, P. Virtanen, M. Elovainio, and J. Vahtera. 2005. “Temporary employment and health: A review.” International Journal of Epidemiology 34(3): 610–622.
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- 168 Burgard S, Lin K. 2013. Bad jobs, bad health? How work and working conditions contribute to health disparities. Am Behav Sci: 57(8)

in secure jobs, and improve the health of the population. Measures in the Scoping Plan that aim to reduce GHGs can simultaneously improve health and social equity by prioritizing or requiring that: (1) infrastructure projects using public funds pay living wages, provide quality benefits to all employees, and minimize nonstandard work; (2) locals are hired as much as is feasible; (3) preference is given for women-owned and minority-owned businesses; (4) employers receiving public funds assess and reduce work stress and lack of workplace control; (5) projects benefiting from State climate investments prioritize hiring from historically hard-to-employ groups, such as youth (especially youth of color), formerly incarcerated people, and people with physical or mental illness; and (6) training is provided to these same groups to work in jobs in sectors that will support a sustainable economy.

Communications Supporting Climate Change Behaviors and Policies

California's leadership on GHG reductions is exceptional. However, climate mitigation goals are often treated independently by sector, and the public does not see a unified message that changes must take place on every level in every sector to preserve human health and well-being. Climate strategy could be supported by public communications campaigns that link sectors and present a message of the need for bold action, along with the benefits that action can yield. Mass media communications and social marketing campaigns can help shift social and cultural norms toward sustainable and healthy practices. Messaging about the co-benefits of climate change policies in improving health and well-being can lead to increased community and decision-maker support among vulnerable groups for policies and measures outlined in the Scoping Plan.

Community Engagement Leads to Robust, Lasting, and Effective Climate Policies

For California's climate change policies to be supported by the public and be implemented with enthusiasm, they must be developed through ample, genuine opportunities for community members to discuss and provide input. Californians' contributions to the policy arena strengthen the end products and assist in their implementation and enforcement.

Efforts to mitigate climate change through policy, environmental, and systems change present considerable opportunities to promote sustainable, healthy, resilient, and equitable communities. The measures in the Scoping Plan, and the way they are implemented, can help create living conditions that facilitate physical activity; encourage public transit use; provide access to affordable, fresh, and nutritious foods; protect the natural systems on which human health depends; spur economic development; provide safe, affordable, and energy-efficient housing; enable access to jobs; and increase social cohesion and civic engagement. These climate change mitigation measures can improve overall population health, as well as material conditions, access to opportunity, and health and well-being in communities facing health inequities. Approaching the policy solutions outlined in the Scoping Plan with a health and equity lens can ultimately help lead to a California in which all current and future generations of Californians can benefit and thrive.

Environmental Analysis

CARB, as the lead agency, prepared a Draft Environmental Analysis (Draft EA) in accordance with the requirements of the California Environmental Quality Act (CEQA) and CARB's regulatory program (CARB's program has been certified as complying with CEQA by the Secretary of Natural Resources; see California Code of Regulation, title 17, sections 60006-60008; California Code of Regulation, title 14, section 15251, subdivision (d)). The resource areas from the CEQA Guidelines Environmental Checklist were used as a framework for a programmatic environmental analysis of the reasonably foreseeable compliance responses resulting from implementation of the measures proposed in the Scoping Plan to achieve the 2030 target. Following circulation of the Draft EA for an 80-day public review and comment period (January 20, 2017 through April 10, 2017), CARB prepared the Final Environmental Analysis Prepared for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (Final EA), which includes minor revisions to the Draft EA, and the Response to Comments on the Draft Environmental Analysis prepared for the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (RTC). The Final EA is included as Appendix F to the 2017 Scoping Plan. The Final EA and RTC were posted on CARB's Scoping Plan webpage before the Board hearing in December 2017.

The Final EA provides a programmatic level of analysis of the adverse environmental impacts that are reasonably foreseeable as resulting from implementation of the proposed Scoping Plan measures; feasible mitigation measures; a cumulative impacts analysis and an alternatives analysis.

Collectively, the Final EA concluded that implementation of these actions could result in the following short-term and long-term beneficial and adverse environmental impacts:

- Beneficial long-term impacts to air quality, energy demand and greenhouse gas emissions.
- Less than significant impacts to energy demand, resources related to land use planning, mineral resources, population and housing, public services, and recreational services.
- Potentially significant and unavoidable adverse impacts to aesthetics, agriculture and forest resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, resources related to land use planning, noise, recreational services, transportation/traffic, and utilities and service systems.

The potentially significant and unavoidable adverse impacts are disclosed for both short-term construction-related activities and long-term operational activities, which explains why some resource areas are identified above as having both less-than-significant impacts and potentially significant impacts. For a summary of impacts, please refer to the table in Attachment B to the Final EA.

Chapter 4

KEY SECTORS

Climate change mitigation policies must be considered in the context of the sector's contribution to the State's total GHGs, while also considering any co-benefits for criteria pollutant and toxic air contaminant reductions. The transportation, electricity (in-state and imported), and industrial sectors are the largest contributors to the GHG inventory and present the largest opportunities for GHG reductions. However, to ensure decarbonization across the entire economy and to meet our 2030 GHG target, policies must be considered for all sectors. Policies that support energy efficiency, alternative fuels, and renewable power also can provide co-benefits for both criteria and toxic air pollutants.

The specific policies identified in this Scoping Plan are subject to additional analytical and public processes to refine the requirements and methods of implementation. For example, a change in the LCFS Carbon Intensity (CI) target would only take effect after a subsequent rulemaking for that regulation, which would include its own public process and environmental, economic, and public health analyses. As described in Chapter 2, many policies for reducing emissions toward the 2030 target are already known. This Scoping Plan identifies these and additional policies or program enhancements needed to achieve the remaining GHG reductions in a complementary, flexible, and cost-effective manner to meet the 2030 target. These policies should continue to encourage reductions beyond 2030 to keep us on track to stabilize the climate. Policies that ensure economy-wide investment decisions that incorporate consideration of GHG emissions are particularly important.

As we pursue GHG reduction targets, we must acknowledge the integrated nature of our built and natural environments, and cross-sector impacts of policy choices. The State's Green Buildings Strategy is one such example of this type of integrated approach. Buildings have tremendous cross-sector interactions that influence our health and well-being and affect land use and transportation patterns, energy use, water use, communities, and the indoor and outdoor environment. Green building regulations and programs offer complementary opportunities to address the direct and indirect effects of buildings on the environment by incorporating strategies to minimize overall energy use, water use, waste generation, and transportation impacts. The Governor's Green Buildings Executive Order B-18-12 for State buildings and the California Green Building Standards (CALGreen) Code¹⁶⁹ are key state initiatives supporting emissions reductions associated with buildings. Local governments are taking action by adopting "beyond code" green building standards. Additional efforts to maintain and operate existing buildings as third-party certified green buildings provides a significant opportunity to reduce GHG emissions associated with buildings. These foundational regulations and programs for reducing building-related emissions are described in more detail in Appendix H. Looking forward, there is a need to establish a path toward transitioning to zero net carbon buildings¹⁷⁰, which will be the next generation of buildings that can contribute significantly to achieving long-term climate goals. A discussion of how the green buildings strategy can support GHG reductions to help meet the 2030 target is provided in Appendix I. Recent research activities have provided results to better quantify GHG emissions reductions of green buildings, and additional research activities need to continue to expand their focus to support technical feasibility evaluations and implementation. Research needs related to green buildings are included in Appendix I.

Further, each of the policies directed at the built environment must be considered in the broader context of the high-level goals for other sectors, including the natural and working lands sector. For example, policies that support natural and working lands can reduce emissions and sequester carbon, while also providing ecosystem benefits such as better water quality, increased water yield, soil health, reduced erosion, and

¹⁶⁹ The authority to update and implement the CALGreen Code is the responsibility of several State agencies identified in California Building Standards Law.

¹⁷⁰ A zero carbon building generates zero or near zero GHG emissions over the course of a year from all GHG emission sources associated, directly and indirectly, with the use and occupancy of the building (initial definition included in the May 2014 *First Update to the Climate Change Scoping Plan*).

habitat connectivity. These policies and co-benefits will be considered as part of the integrated strategy outlined above. Table 16 provides examples of the cross-sector interactions between and among the main sectors analyzed for the Scoping Plan that are discussed in this chapter (Energy, Transportation, Industry, Water, Waste Management, and Natural and Working Lands, including agricultural lands).

This chapter recognizes these interactions and relates these broad strategic options to the specific additional programs recommended in Chapter 2 of this document. Accordingly, Chapter 4 provides an overview of each sector's contributions to the State's GHG emissions, a description of both ongoing and proposed programs and policies to meet the 2030 target, and additional climate policy or actions that could be considered in the future. The wide array of complementary and supporting measures being contemplated or undertaken across State government are detailed here. The broad view of State action described in this chapter thus provides context for the narrower set of measures discussed in detail in Chapter 2 of this Scoping Plan. It is these measures in Chapter 2 that CARB staff has identified as specific actions to meet the 2030 target in SB 32.

The following phrases have specific meanings in this discussion of the policy landscape: "Ongoing and Proposed Measures" refers to programs and policies that are either ongoing existing efforts, or efforts required by statute, or which are otherwise underway or about to begin. These measures include, but are not limited to, those identified as necessary specific actions to meet the 2030 GHG target, and which are set apart and described in greater detail in Chapter 2. "Sector Measures" listed also include cross-cutting measures that affect many entities in the sector; some of these are also identified in Chapter 2. "Potential Additional Actions" are not being proposed as part of the specific strategy to achieve the 2030 target in this Scoping Plan. This Scoping Plan includes this broader, comprehensive, review of these measures because it aims to spur thinking and exploration of innovative new technologies and policies that may help the State achieve its long-term climate goals. Some of these items may not ever be formally proposed, but they are included here because CARB, other agencies, and stakeholders believe their potential should be explored with stakeholders in coming years.

TABLE 16: CROSS-SECTOR RELATIONSHIPS

Sector	Example Interactions with Other Sectors
 Energy	<ul style="list-style-type: none"> • Hydroelectric power, cooling, cleaning, waste water treatment plant (WWTP) bioenergy • Vehicle-to-grid power; electricity supply to vehicle charging infrastructure • Biomass feedstock for bioenergy, land for utility-scale renewable energy (solar, wind) • Agricultural waste and manure feedstocks for bioenergy/biofuels • Organic waste for bioenergy
 Transportation	<ul style="list-style-type: none"> • Electric vehicles, natural gas vehicles, transit/rail; more compact development patterns that reduce vehicle miles traveled (VMT) also demand less energy per capita • More compact development patterns that reduce VMT also demand less water per capita and reduce conversion of natural and working lands • Reducing VMT also reduces energy demands necessary for producing and distributing fuels and vehicles and construction and maintenance of roads • Biomass feedstock for biofuels • Agricultural waste and manure feedstocks for biofuels • Organic waste for biofuels • Greenfield suburban development on natural and working lands leads to increased VMT
 Industry	<ul style="list-style-type: none"> • Potential to electrify fossil natural gas equipment, substitution of fossil-based energy with renewable energy • Greenfield urban development impacts
 Water	<ul style="list-style-type: none"> • Energy consumption for water pumping, treatment, heating; resource for cooling, cleaning; WWTP bioenergy • Use of compost to help with water retention / conservation / drought mitigation • Land conservation results in healthier watersheds by reducing polluted runoff, allowing groundwater recharge, and maintaining properly functioning ecosystems
 Waste Management	<ul style="list-style-type: none"> • Composting, anaerobic digestion, and wastewater treatment plant capacity to help process organic waste diverted from landfills • Compost for carbon sequestration, erosion control in fire-ravaged lands, water conservation, and healthy soils • Replacing virgin materials with recycled materials associated with goods production; enhanced producer responsibility reduces energy impacts of consumption • Efficient packaging materials reduces energy consumption and transportation fuel use
 Agriculture	<ul style="list-style-type: none"> • Crop production, manure management; WWTP biosolids for soil amendments • Agricultural waste and manure feedstocks for bioenergy • Compost production in support of Healthy Soils Initiative
 Natural and Working Lands	<ul style="list-style-type: none"> • Healthy forestlands provide wood and other forest products • Restoring coastal and sub-tidal areas improves habitat for commercial and other fisheries • Sustainable management can provide biomass for electricity • Sustainable management can provide biomass for biofuels • Resilient natural and working lands provide habitat for species and functions to store water, recharge groundwater, naturally purify water, and moderate flooding. Forests are also a source of compost and other soil amendments. • Conservation and land protections help reduce VMT and increase stable carbon pools in soils and above-ground biomass

Low Carbon Energy

The energy sector in California is composed of electricity and natural gas infrastructure, which brings electricity and natural gas to homes, businesses, and industry. This vast system is critical to California's economy and public well-being, and pivotal to reducing its GHG emissions.

Historically, power plants generated electricity largely by combusting fossil fuels. In the 1970s and early 1980s, a significant portion of California's power supply came from coal and petroleum resources. To reduce air pollution and promote fuel diversity, the State has shifted away from these resources to natural gas, renewable energy, and energy efficiency programs, resulting in significant GHG emissions reductions. Emissions from the electricity sector are currently approximately 20 percent below 1990 levels and are well on their way to achieving deeper emissions cuts by 2030. Since 2008, renewable generation has almost doubled, coal generation has been reduced by more than half, and GHG emissions have been reduced by a quarter.

Carbon dioxide is the primary GHG associated with electricity and natural gas systems. The electricity sector, which is composed of in-State generation and imported power to serve California load, has made great strides to help California achieve its climate change objectives. Renewable energy has shown tremendous growth, with capacity from solar, wind, geothermal, small hydropower, and biomass power plants growing from 6,600 megawatts (MW) in 2010 to 27,500 MW as of June 2017.¹⁷¹

Renewable energy adoption in California has been promoted through the RPS and several funding mechanisms, such as the California Solar Initiative (CSI) programs, Self-Generation Incentive Program (SGIP), Net-Energy Metering (NEM), and federal tax credits. These mandates and incentives have spurred both utility-scale and small-scale customer-developed renewable energy projects. SB 350 increased the RPS requirement from 33 percent by 2020 to 50 percent by 2030.

SB 350 requires publicly-owned utilities under the jurisdiction of the California Energy Commission (CEC) and all load-serving entities under the jurisdiction of the California Public Utilities Commission (CPUC) to file integrated resource plans (IRPs) with the CEC and CPUC, respectively. Through their IRPs, filing entities will demonstrate how they will plan to meet the electricity sector's share of the State's 2030 GHG reduction target while ensuring reliability in a cost-effective manner. The CEC and CPUC have developed the guidelines that publicly-owned utilities and load-serving entities will follow to prepare and submit IRPs, and CARB is working collaboratively with CEC and CPUC to set the sector and utility and load-serving entity planning targets. The Scoping Plan provides information to help establish the range of GHG reductions required for the electricity sector, and those numbers will be translated into planning target ranges in the IRP process. The IRP processes as currently proposed by CEC and CPUC staff will grant publicly-owned utilities flexibility to determine the optimal way to reduce GHG emissions, and load serving entities some flexibility to achieve the electricity sector's share of the 2030 goal. The CPUC has developed a Reference System Plan to help guide investment, resource acquisition, and programmatic decisions to reach the State's policy goals, in addition to informing the development of individual load serving entities' IRPs.

Energy efficiency is another key component to reducing energy sector GHG emissions, and is another consideration in each agency's IRP process. Utilities have been offering energy efficiency programs, such as incentives, to California customers for decades, and CEC has continually updated building and appliance standards. In the context of IRPs, utility-ratepayer-funded energy efficiency programs will likely continue to play an important role in reducing GHG emissions in the electricity sector.

SB 350 requires CEC and CPUC to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030. These targets can be achieved through appliance and building energy efficiency standards; utility incentive, rebate, and technical assistance programs; third-party delivered energy efficiency programs; and other programs. Achieving greater efficiency savings in existing buildings, as directed by Governor Brown in his 2015 inaugural speech, will be essential to meet the goal of doubling energy efficiency savings. In September 2015, CEC adopted the Existing Buildings Energy Efficiency Action Draft Plan, which is designed to provide foundational support and strategies to enable scaling of energy efficiency in the built environment. Pursuant to SB 350, CEC published an updated Existing Buildings Energy Efficiency Action Plan prior to January 2017. More than \$10 billion in private capital investment will be needed

171 California Energy Commission. August, 2017. Tracking Progress. Renewable Energy – Overview. http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf

to double statewide efficiency savings in California.¹⁷² Energy efficiency programs are one part of the broader green buildings strategy, which incorporates additional measures to minimize water use, waste generation, and transportation impacts. The green buildings strategy is described in further detail in Appendix I.

Heating fuels used for activities such as space and water heating in the residential, commercial, and industrial sectors represent a significant source of GHG emissions. Transitioning to cleaner heating fuels is part of the solution of achieving greater efficiency savings in existing buildings and has significant GHG emissions reductions potential. Examples of this transition can include use of renewable gas and solar thermal, as well as electrification of end uses in residential, commercial, and industrial sectors. However, achieving significant GHG emissions reductions can only be achieved by decarbonizing the electricity sector – switching from natural gas end uses to electricity generated by burning natural gas would not be effective. Electrification can complement renewables and energy storage if implemented in an integrated, optimized manner. Other hurdles that will have to be overcome include electric equipment performance across all California climate regions, seasonal variations of renewable generation, cost-effectiveness, and consumer acceptance of different heating fuel options.

Fossil-fuel-based natural gas is a significant fuel source for both in-State electricity generation and electricity imported into California. It is also used in transportation applications and in residential, commercial, industrial, and agricultural sector end uses. Greenhouse gas emissions from combustion of fossil natural gas decreased from 134.71 MMTCO₂e in 2000 to 126.98 MMTCO₂e in 2015, while natural gas pipeline fugitive emissions were estimated to be 4.0 MMTCO₂e in 2015 and have been nearly unchanged since 2000.¹⁷³ Greenhouse gas-reduction strategies should focus on efficiency, reducing leakage from wells and pipelines, implementing the SLCP strategy, and studying the potential for renewable gas fuel switching (e.g., renewable hydrogen blended with methane or biomethane).

Moving forward, reducing use of fossil natural gas wherever possible will be critical to achieving the State's long-term climate goals. For end uses that must continue to rely on natural gas, renewable natural gas could play an important role. Renewable natural gas volume has been increasing from approximately 1.5 million diesel gallon equivalent (dge) in 2011 to more than 68.5 million dge in 2015, and continued substitution of renewable gas for fossil natural gas would help California reduce its dependence on fossil fuels. In addition, renewable gas can be sourced by in-vessel waste digestion (e.g., anaerobic digestion of food and other organics) and recovering methane from landfills, livestock operations, and wastewater treatment facilities through the use of existing technologies, thereby also reducing methane emissions. The capture and productive use of renewable methane from these and other sources is consistent with requirements of SB 1383.

Collectively, renewable energy and energy efficiency measures can result in significant public health and climate benefits by displacing air pollution and GHG emissions from fossil-fuel based energy sources, as well as by reducing the health and environmental risks associated with the drilling, extraction, transportation, and storage of fossil fuels, especially for communities living near fossil-fuel based energy operations.

As the energy sector continues to evolve and decarbonize, both the behavior of individual facilities and the design of the grid itself will change, with important distributional effects. Some power plants may operate more flexibly to balance renewables, emerging technologies (examples include storage, smart inverters, renewably-fueled fuel cells, and others) will become more prevalent, and aging facilities may retire and be replaced. In turn, this may shift patterns of criteria pollutant emissions at these facilities. Because many existing power plants are in, or near, disadvantaged communities, it is of particular importance to ensure that this transition to a cleaner grid does not result in unintended negative impacts to these communities.

Appendix H highlights the more significant existing policies, programs, measures, regulations, and initiatives that provide a framework for helping achieve GHG emissions reductions in this sector.

172 California Energy Commission. 2016. Existing Building Energy Efficiency Action Plan. page 61. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/16-EBP-01/TN214801_20161214T155117_Existing_Building_Energy_Efficiency_Plan_Update_Deceber_2016_Thi.pdf

173 CARB. 2017. CARB's Emission Inventory Activities. www.arb.ca.gov/ei/ei.htm

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Electricity Goals

- Achieve sector-wide, publicly-owned utility, and load-serving entity specific GHG reduction planning targets set by the State through Integrated Resource Planning.
- Reduce fossil fuel use.
- Reduce energy demand.

Natural Gas Goals

- Ensure safety of the natural gas system.
- Decrease fugitive methane emissions.
- Reduce dependence on fossil natural gas.

Cross-Sector Interactions

The energy sector interacts with nearly all sectors of the economy. Siting of power plants (including solar and wind facilities) and transmission and distribution lines have impacts on land use in California—be it conversion of agricultural or natural and working lands, impacts to sensitive species and habitats, or implications to disadvantaged, vulnerable, and environmental justice communities. Additionally, more compact development patterns reduce per capita energy demands, while less-compact sprawl increases them. Further, efforts to reduce GHG emissions in the transportation sector include electrification, such as PHEVs, BEVs, and FCEVs. Some industrial sources also use electricity as a primary or auxiliary source of power for manufacturing. In the future, industrial facilities may electrify their systems instead of relying on natural gas. These activities will increase demand in this sector. In addition, water is used in various applications in the energy sector, ranging in intensity from cooling of turbines and other equipment at power plants to cleaning solar photovoltaic panels. Given California's recent historic drought, water use for the electricity sector is an important consideration for operation, maintenance, and construction activities.

Continued planning and coordination with federal, State, and local agencies, governments, Tribes, and stakeholders will be crucial to minimizing environmental and health impacts from the energy sector, deploying new technologies, and identifying feedstocks.

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit.

Ongoing and Proposed Measures – Electricity

- Per SB 350, with respect to Integrated Resource Plans, establish GHG planning targets for the electricity sector, publicly-owned utilities, and load-serving entities.
- Per SB 350, ensure meaningful GHG emissions reductions by publicly-owned utilities and load-serving entities through Integrated Resource Planning.
- Per AB 197, prioritize direct reductions at large stationary sources, including power-generating facilities.
- Per SB 350, increase the RPS to 50 percent of retail sales by 2030 and ensure grid reliability.
- Per Governor Brown's Clean Energy Jobs Plan, AB 327 (Perea, Chapter 611, Statutes of 2013), and AB 693 (Eggman, Chapter 582, Statutes of 2015), increase development of distributed renewable generation, including for low income households.
- Continue to increase use of distributed renewable generation at State facilities where space allows.
- Increase retail customers' use of renewable energy through optional utility 100 percent renewable energy tariffs.
- Continue GHG reductions through participation in the California Independent System Operator (CAISO) Energy Imbalance Market.

- Per SB 350, efforts to evaluate, develop, and deploy regionalization of the grid and integration of renewables via regionalization of the CAISO should continue while maintaining the accounting accuracy and rigor of California's GHG policies.
- Per SB 350, establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030.
- Per SB 350, implement the recommendations of the Barriers Study for increasing access to renewable energy generation for low-income customers, energy efficiency and weatherization investments for low-income customers, and contracting opportunities for local small business in disadvantaged communities.¹⁷⁴ And, track progress towards these actions over time to ensure disadvantaged communities are getting equal access and benefits relative to other parts of the State.
- Continue implementation of the Regulations Establishing and Implementing a Greenhouse Gases Emission Performance Standard for Local Publicly Owned Electric Utilities as required by SB 1368 (Perata, Chapter 598, Statutes of 2006), which effectively prohibits electric utilities from making new long-term investments in high-GHG emitting resources such as coal power.
- Per AB 802 (Williams, Chapter 590, Statutes of 2015), adopt the forthcoming CEC regulations governing building energy use data access, benchmarking, and public disclosure.
- Per AB 2868 (Gatto, Chapter 681, Statutes of 2016), encourage development of additional energy storage capacity on the transmission and distribution system.
- Per AB 758 (Skinner, Chapter 470, Statutes of 2009),¹⁷⁵ implement recommendations under State jurisdiction included in the AB 758 Action Plan developed by CEC.

Ongoing and Proposed Measures – Natural Gas

- Implement the CARB Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities to reduce fugitive methane emissions from storage and distribution infrastructure.
- Per SB 1371 (Leno, Chapter 525, Statutes of 2014), adopt improvements in investor-owned utility (IOU) natural gas systems to address methane leaks.
- Implement the SLCP Strategy to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use.
- Per SB 1383, CEC will develop recommendations for the development and use of renewable gas as part of its 2017 Integrated Energy Policy Report (IEPR).
- Per SB 1383, adopt regulations to reduce methane emissions from livestock manure and dairy manure management operations by up to 40 percent below the dairy sector's and livestock sector's 2013 levels by 2030, including establishing energy infrastructure development and procurement policies needed to encourage dairy biomethane projects. The regulations will take effect on or after January 1, 2024.
- Per SB 1383, reduce methane emissions at landfills by reducing landfill disposal of organic waste 75 percent below 2014 levels by 2025, including establishing energy infrastructure development and procurement policies needed to encourage in-vessel digestion projects and increase the production and use of renewable gas.
- Per SB 887 (Pavley, Chapter 673, Statutes of 2016), initiate continuous monitoring at natural gas storage facilities and (by January 1, 2018) mechanical integrity testing regimes at gas storage wells, develop regulations for leak reporting, and require risk assessments of potential leaks for proposed new underground gas storage facilities.
- Per Public Utilities (PU) Code 454.56, CPUC, in consultation with CEC, (1) identifies all potentially achievable cost-effective natural gas efficiency savings and establishes gas efficiency targets for the gas corporation to achieve, and (2) requires gas corporations to first meet unmet resource needs through available natural gas efficiency and demand reduction resources that are cost-effective, reliable, and feasible (PU Codes 890–

¹⁷⁴ CEC. 2016. Low-Income Barriers Study, Part A: Overcoming Barriers to Energy Efficiency and Renewables for Low-Income Customers and Small Business Contracting Opportunities in Disadvantaged Communities. http://docketpublic.energy.ca.gov/PublicDocuments/16-OIR-02/TN214830_20161215T184655_SB_350_LowIncome_Barriers_Study_Part_A_Commission_Final_Report.pdf

¹⁷⁵ AB 758 requires CEC, in collaboration with CPUC, to develop a comprehensive program to achieve greater energy efficiency in the State's existing buildings.

- 900 provide public goods charge funding authorization for these programs).
- Per SB 185 (De Leon, Chapter 605, Statutes of 2015), implement the requirement for the California Public Employees' Retirement System (CalPERS) and the California State Teachers' Retirement System (CalSTRS) to sell their holdings in coal-producing companies by June 1, 2017, and explore extending divestiture requirements for additional fossil-fuel assets.

Sector Measures

- Implement the post-2020 Cap-and-Trade Program.

Potential Additional Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals. It is anticipated that there will be workshops and other stakeholder forums in the years following finalization of the Scoping Plan to explore these potential actions.

- Further deploy fuel cells that use renewable fuels or those that generate electricity that is less carbon intensive than the grid.
- Increase use of renewable energy through long-term agreements between customers and utilities (such as Sacramento Municipal Utility District Solar Shares).
- Develop rules needed for the development of electricity storage technologies.
- Adopt a zero net energy (ZNE) standard for residential buildings by 2018/2019, and for commercial buildings by 2030.
- Through a public process, evaluate and set targets for the electrification of space and water heating in residential and commercial buildings and cleaner heating fuels that will result in GHG reductions, and identify actions that can be taken to spur market transformation in the 2021-2030 period.
- Expand the State Low-Income Weatherization Program (LIWP) to continue to improve energy efficiency and weatherize existing residential buildings, particularly for low-income individuals and households.
- Decrease usage of fossil natural gas through a combination of energy efficiency programs, fuel switching, and the development and use of renewable gas in the residential, commercial, and industrial sectors.
- Accelerate the deployment of heat pumps and the replacement of diesel generators.
- Consider enhanced energy efficiency (high efficiency air conditioners, light-emitting diode (LED) lamps, efficiency improvements in industrial process cooling and refrigeration, efficient street lighting).
- Promote programs to support third-party delivered energy efficiency projects.
- Per AB 33 (Quirk, Chapter 680, Statutes of 2016), consider large-scale electricity storage.
- Support more compact development patterns to promote reduced per capita energy demand (see the Transportation sector for specific policy recommendations).

Industry

California's robust economy, with the largest manufacturing sector in the United States, is supported by a variety of sub-industrial sectors, some of which include cement plants, refineries, food processors, paper products, wineries, steel plants, and industrial gas, entertainment, technology and software, aerospace, and defense companies. Together, industrial sources account for approximately 21 percent of the State's GHG emissions—almost equal to the amount of GHG emissions from the energy sector. Emissions in this sector are mainly due to fuel combustion and, in some industries, process-related emissions. Changes in this sector strongly correlate with changes in the overall economy. For example, housing and construction growth usually increases demand for cement. Moving toward a cleaner economy and ensuring we meet the statewide targets requires us to address GHG emissions in this sector, which has the potential to provide local co-benefits in criteria pollutant and toxic air contaminant reductions in immediate surrounding locations, especially in vulnerable communities. At the same time, we must ensure there is a smooth path to a cleaner future to support a resilient and robust economy with a strong job force, including training opportunities for workers in disadvantaged communities, while continuing to support economic growth in existing and new industries.

Greenhouse gas emissions in the Industrial sector have remained relatively flat for the last few years while the State's economy has continued to grow, meaning the GHG emissions to produce each dollar of gross standard product is decreasing. Manufacturing accounts for approximately 10 percent of the gross state product.¹⁷⁶ In 2016, California industry exported \$163.6 billion in merchandise.¹⁷⁷

Policies to address GHG emissions reductions must continue to balance the State's economic well-being with making progress toward achievement of the statewide limits.

As this sector is dominated by combustion-related emissions, policies and measures to supply cleaner fuels and more efficient technology are the key to reducing GHG emissions. Some sectors, such as cement and glass, also have significant process emissions, and it may be more challenging to address those process emissions, as they are related to chemical reactions and processes to meet safety, product-specific, or regulatory standards for the final products. Another important aspect for this sector is its role as the State transitions to a cleaner future. Infrastructure, including existing facilities and new facilities, can support the production of new technology to bolster the State's efforts to address GHGs. For example, existing refineries have an opportunity to move away from fossil fuel production and switch to the production of biofuels and clean technology. As the State works to double energy efficiency in existing buildings, there will be an increased demand for efficient lighting fixtures, building insulation, low-e¹⁷⁸ coatings for existing windows, or new windows—goods which could be produced in California. The predominant paths to reducing GHG emissions for the Industrial sector are: fuel switching, energy efficiency improvements, and process modifications. Carbon capture and sequestration also offers a potential new, long-term path for reducing GHGs for large stationary sources.

Relocation of production to outside the State would also reduce emissions, but this is disadvantageous for a couple of reasons and efforts are needed to avoid this outcome. First, AB 32 requires the State's climate policies to minimize emissions leakage, and relocation would shift GHG emissions outside of the State without the benefit of reducing pollutants that contribute to overall global warming impacts. Second, it could also reduce the availability of associated jobs and could impact a local tax base that supports local services such as public transportation, emergency response, and social services, as well as funding sources critical to protecting the natural environment and keeping it available for current and future generations.

Even while we continue to seek further GHG reductions in the sector, it is important to recognize the State has a long history of addressing health-based air pollutants in this sector. Many of the actions for addressing criteria pollutants and toxic air contaminants in the industrial sector are driven by California's local air district stationary source requirements to ensure progress toward achieving State and national ambient air quality standards. Some of those actions, such as use of Best Available Control Technology, have resulted in co-benefits in the form of GHG reductions. The State must continue to strengthen its existing criteria and toxic air pollutant programs and relationships with local air districts to ensure all Californians have healthy, clean air. This is especially true in disadvantaged communities.

AB 32 directed CARB to take several actions to address GHG emissions, such as early action measures, GHG reporting requirements for the largest GHG sources, and other measures. In response, the State adopted multiple measures and regulations, including regulations for high global warming potential (high-GWP) gases used in refrigeration systems and the semiconductor industry.¹⁷⁹ These regulations apply to specific GHGs and types of equipment that can be found across the economy. For example, high-GWP gases are found in refrigeration systems in large food processing plants and chemical and petrochemical facilities, among others.¹⁸⁰

The State has also adopted the first in the world economy-wide cap-and-trade program that applies to all large industrial GHG emitters, imported electricity, and fuel and natural gas suppliers. As discussed in Chapters 2 and 3, the Cap-and-Trade Program is a key element of California's GHG reduction strategy. The

176 <http://www.investopedia.com/articles/investing/011416/californias-economy-9-industries-driving-gdp-growth.asp>

177 U.S. Department of Commerce. International Trade Administration. 2017. California Exports, Jobs, & Foreign Investment. www.trade.gov/mas/ian/statereports/states/ca.pdf

178 Low-e coatings reduce the emissivity, or heat transfer, from a window to improve its insulating properties.

179 CARB. Refrigerant Management Program. www.arb.ca.gov/cc/rmp/rmp.htm

180 The U.S. Environmental Protection Agency (U.S. EPA) has also enacted regulations to reduce hydrofluorocarbon (HFC) emissions by prohibiting high-GWP refrigerants in new retail food refrigeration equipment and in chillers used for large air-conditioning applications. On the international level, the European Union F-gas regulations went into effect January 1, 2015. Those regulations prohibit high-GWP HFCs in new equipment and require a gradual phasedown in the production and import of HFCs. A similar HFC phasedown that would take place globally was the subject of international negotiations during the Montreal Protocol meeting in Rwanda in October, 2016. Those negotiations resulted in an agreement that will phase down the use of HFCs and put the world on track to avoid nearly 0.5°C of warming by 2100.

Cap-and-Trade Program establishes a declining limit on major sources of GHG emissions, and it creates a powerful economic incentive for major investment in cleaner, more efficient technologies. The Cap-and-Trade Program applies to emissions that cover about 85 percent of the State's GHG emissions. CARB creates allowances equal to the total amount of permissible emissions (i.e., the "cap") over a given compliance period. One allowance equals one metric ton of GHG emissions. Fewer allowances are created each year, thus the annual cap declines and statewide emissions are reduced over time. An increasing annual auction reserve (or floor) price for allowances and the reduction in annual allowance budgets creates a steady and sustained pressure for covered entities to reduce their GHGs. All covered entities in the Cap-and-Trade Program are still subject to the air quality permit limits for criteria and toxic air pollutants.

The Cap-and-Trade Program is designed to achieve the most cost-effective statewide GHG emissions reductions; there are no individual or facility-specific GHG emissions reductions requirements. Each entity covered by the Cap-and-Trade Program has a compliance obligation that is set by its GHG emissions over a compliance period, and entities are required to meet that compliance obligation by acquiring and surrendering allowances in an amount equal to their compliance obligation. Companies can also meet a limited portion of their compliance obligation by acquiring and surrendering offset credits, which are compliance instruments that are based on rigorously verified emissions reductions that occur from projects outside the scope of the Cap-and-Trade Program. Like allowances, each offset credit is equal to one metric ton of GHG emissions. The program began in January 2013 and achieved a near 100 percent compliance rate for the first compliance period (2013–2014). Reported and verified emissions covered by the Cap-and-Trade Program have been below the cap throughout the first years of the Program.¹⁸¹

Allowances are issued by CARB and distributed by free allocation and by sale at auctions. CARB also provides for free allocation to some entities covered by the Program to address potential trade exposure due to the cost of compliance with the Program and address concerns of relocation of production out-of-state and resulting emissions leakage. Offset credits are issued by CARB to qualifying offset projects. Secondary markets exist where allowances and offset credits may be sold and traded among Cap-and-Trade Program participants. Facilities must submit allowances and offsets to match their annual GHG emissions. Facilities that emit more GHG emissions must surrender more allowances or offset credits, and facilities that can cut their emissions need to surrender fewer compliance instruments. Entities have flexibility to choose the lowest-cost approach to achieving program compliance; they may purchase allowances at auction, trade allowances and offset credits with others, take steps to reduce emissions at their own facilities, or utilize a combination of these approaches. Proceeds from the sale of State-owned allowances at auction are placed into the Greenhouse Gas Reduction Fund.

It is important to note that while the Cap-and-Trade Program is designed to reduce GHGs for the industrial sector, there are recommendations from the EJAC (or Committee) for the State to pursue more facility-specific GHG reduction measures to achieve potential local air quality co-benefits, and AB 197 directs CARB to prioritize direct reductions at large stationary sources. The Committee has expressed a strong preference to forgo the existing Cap-and-Trade Program and rely on prescriptive facility level regulations.

We agree with the EJAC that more can and should be done to reduce emissions of criteria pollutants and toxic air contaminants. These pollutants pose air quality and related health issues to the communities adjacent to the sources of industrial emissions. Further, many of these communities are already disadvantaged and burdened by a variety of other environmental stresses. As described in Chapter 3, however, there is not always a direct correlation between emissions of GHGs, criteria pollutants, and toxic air contaminants. Also, relationships between these pollutants are complex within and across industrial sectors. The solution, therefore, is not to do away with or change the regulation of GHGs through the Cap-and-Trade Program to address these legitimate concerns; instead, consistent with the direction in AB 197 and AB 617, State and local agencies must evaluate and implement additional measures that directly regulate and reduce emissions of criteria and toxic air pollutants through other programs.

181 CARB. 2016. Mandatory Greenhouse Gas Emissions Reporting. www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Goals

- Increase energy efficiency.
- Reduce fossil fuel use.
- Promote and support industry that provides products and clean technology needed to achieve the State's climate goals.
- Create market signals for low carbon intensity products.
- Maximize air quality co-benefits.
- Support a resilient low carbon economy and strong job force.
- Make California the epicenter for research, development, and deployment of technology needed to achieve a near-zero carbon future.
- Increase in-State recycling manufacturing.

Cross-Sector Interactions

There are clear, direct relationships between the industrial sector and other sectors that go beyond the economic support that a strong economy provides. For instance, this sector could increase its use of renewable fuels such as biomethane, which would be sourced from landfills or dairies. Additionally, some industries could shift from raw materials to recycled materials to reduce waste and reduce GHG emissions associated with processing of raw materials. Further, addressing energy efficiency could reduce onsite heating, water, and fuel demand. Moreover, supporting mass-transit or ride share programs for employees would reduce VMT. Finally, upgrading existing facilities or repurposing existing infrastructure instead of constructing new facilities or infrastructure would support land conservation and smart growth goals.

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit.

Ongoing and Proposed Measures

- At the October 2016 annual Montreal Protocol Meeting of Parties in Kigali, Rwanda, an international amendment to globally phase down HFC production was agreed upon by more than 150 countries. Depending on the level of future HFC emissions reductions expected for California from the Kigali Agreement, California may also: (1) consider placing restrictions on the sale or distribution of refrigerants with a GWP > 2,500, and (2) consider prohibiting refrigerants with a GWP ≥ 150 in new stationary refrigeration equipment and refrigerants with a GWP ≥ 750 for new stationary air-conditioning equipment. At the time the SLCP Strategy was finalized, U.S. EPA was expected to continue implementing certain HFC reductions under its Significant New Alternatives Policy (SNAP). Recent litigation may result in CARB implementing similar measures as state law instead.
- Develop a regulatory monitoring, reporting, verification, and implementation methodology for the implementation of carbon capture and sequestration projects.
- Implement the CARB Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities to reduce fugitive methane emissions from storage and distribution infrastructure.

Sector Measures

- Implement the post-2020 Cap-and-Trade Program.
- Continue and strategically expand research and development efforts to identify, evaluate, and help deploy innovative strategies that reduce GHG emissions in the industrial sector.
- Promote procurement policies that prioritize low carbon production to delivery options, including at the State and local government levels.
- Identify and remove barriers to existing grant funding for onsite clean technology or efficiency upgrades.

Potential Additional Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals. It is anticipated that there will be workshops and other stakeholder forums in the years following finalization of the Scoping Plan to explore these potential actions.

- Further deploy fuel cells that use renewable fuels or those that generate electricity that is less carbon intensive than the grid.
- Decrease usage of fossil natural gas through a combination of efficiency, fuel switching, and the development and use of renewable gas.
- Partner with California's local air districts to effectively use BARCT to achieve air quality and GHG reduction co-benefits at large industrial sources.
- Evaluate the potential for and promote electrification for industrial stationary sources whose main emissions are onsite natural gas combustion.
- Identify new funding for grants and tariff opportunities for onsite clean technology, efficiency upgrades, diesel generator replacement, or recycling manufacturing technology.
- Develop an incentive program to install low-GWP refrigeration systems in retail food stores.
- Evaluate and design additional mechanisms to further minimize emissions leakage in the Cap-and-Trade Program (e.g., border carbon adjustment).

Transportation Sustainability

California's population is projected to grow to 50 million people by 2050. How and where the State grows will have important implications for all sectors of the economy, especially the transportation sector. Supporting this growth while continuing to protect the environment, developing livable and vibrant communities, and growing the economy is dependent on transitioning the State's transportation system to one powered by ZEVs (including PHEVs, BEVs, and FCEVs) and low carbon fuels. It must also offer other attractive and convenient low carbon transportation choices, including safe walking and bicycling, as well as quality public transportation. Investments should consider California's diverse communities and provide accessible and clean travel options to all while drastically reducing reliance on light-duty combustion vehicles.

The transportation system in California moves people between home, work, school, shopping, recreation, and other destinations, and connects ports, industry, residential communities, commercial centers, educational facilities, and natural wonders.¹⁸² California's vast transportation system includes roads and highways totaling more than 175,000 miles and valued at approximately \$1.2 trillion, 500 transit agencies, 245 public-use airports, 12 major ports, and the nation's first high-speed rail system, now under construction.¹⁸³ Transportation infrastructure also includes sidewalks, bicycle paths, parking, transit stations and shelters, street trees and landscaping, signage, lighting, and other elements that affect the convenience, safety, and accessibility of transportation choices. Increasingly, technologies such as real-time, web- and mobile-enabled trip planning and ride-sourcing services are changing how people travel. In the near future, automated and connected vehicles, and unmanned aerial systems (e.g., drones) are expected to be part of our transportation landscape and to transform the way that people and freight are transported. Responsibility for the transportation system is spread across State, regional, and local levels.

Through effective policy design, the State has an opportunity to guide technology transformation and influence investment decisions with a view to mitigate climate and environmental impacts while promoting economic opportunities and community health and safety. The network of transportation technology and infrastructure, in turn, shapes and is shaped by development and land use patterns that can either support or detract from a more sustainable, low carbon, multi-modal transportation future. Strategies to reduce GHG emissions from the transportation sector, therefore, must actively address not only infrastructure and technology, but also coordinated strategies to achieve development, conservation, and land use patterns that align with the State's GHG and other policy goals.

Transportation also enables the movement of freight such as food, building materials, and other consumable products, as well as waste and recyclables. The California freight system includes myriad equipment and

¹⁸² Caltrans. California Transportation Plan 2040, February 2016.

¹⁸³ Ibid.

facilities,¹⁸⁴ and is the most extensive, complex, and interconnected system in the country, with approximately 1.5 billion tons of freight valued at \$2.8 trillion shipped in 2015 to, through, and within California.¹⁸⁵ Freight-dependent industries accounted for over \$740 billion of California's GDP and over 5 million California jobs in 2014.^{186, 187}

Transportation has a profound and varied impact on individuals and communities, including benefits such as economic growth, greater accessibility, and transport-related physical activity, and adverse consequences such as GHG emissions, smog-forming and toxic air pollutants, traffic congestion, and sedentary behaviors. The sector is the largest emitter of GHG emissions in California. Air pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease, and early death, with disproportionate impacts on vulnerable populations such as children, the elderly, those with existing health conditions (e.g., chronic obstructive pulmonary disease, or COPD), low-income communities, and communities of color.^{188, 189, 190, 191, 192} Importantly, transportation costs are also a major portion of most Californian's household budgets.¹⁹³ Additionally, dependence on cars has a direct impact on levels of physical activity, which is closely linked to multiple adverse health outcomes.

Fortunately, many measures that reduce transportation sector GHG emissions simultaneously present opportunities to bolster the economy, enhance public health, revitalize disadvantaged communities, strengthen resilience to disasters and changing climate, and improve Californians' ability to conveniently access daily destinations and nature. These opportunities are particularly important for those who are not able to, or cannot afford to, drive. In addition, a growing market demand for walkable, bikeable, and transit-accessible communities presents a significant opportunity to shift California's transportation systems toward a lower-carbon future while realizing significant public health benefits through increased levels of physical activity (e.g., walking and bicycling). In fact, transport-related physical activity could result in reducing risks from chronic diseases such as cardiovascular disease, diabetes, certain cancers, and more, to such an extent that it would rank among the top public health accomplishments in modern history, and help to reduce the billions of dollars California spends each year to treat chronic diseases. Just as California was the first to mitigate the contribution of cars and trucks to urban smog, it is leading the way toward a clean, low carbon, healthy, interconnected, and equitable transportation system.

Continuing to advance the significant progress already underway in the areas of vehicle and fuel technology is critical to the transportation sector strategy and to reducing GHG emissions in the transportation sector. The rapid technological and behavioral changes underway with automated and connected vehicles, unmanned aerial systems, and ride-sourcing services are redefining the transportation sector, and should be part of the solution for a lower carbon transportation sector. It is critical to support and accelerate progress on transitioning to a zero carbon transportation system, while ensuring VMT reductions are still achieved. The growing severity of climate impacts, persistent public health impacts and costs from air pollution,¹⁹⁴ and rapid technology progress that supports the expectation that cost parity between some ZEVs and comparable internal combustion vehicles will be attained in a few years, underscores the need for further

184 The freight system includes trucks, ocean-going vessels, locomotives, aircraft, transport refrigeration units, commercial harborcraft and cargo handling, industrial and ground service equipment used to move freight at seaports, airports, border crossings, railyards, warehouses, and distribution centers.

185 U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration. Freight Analysis Framework, V 4.1, 2016.

186 U.S. Department of Commerce, Bureau of Economic Analysis. Regional Economic Accounts. Available at: www.bea.gov/regional/index.htm, accessed March 11, 2016.

187 State of California Employment Development Department. Labor Market Information by California Geographic Areas. Available at: www.labormarketinfo.edd.ca.gov/geography/lmi-by-geography.html, accessed March 21, 2016.

188 CARB. May 2016. Mobile Source Strategy. Available at: www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.pdf

189 Hoek, G., Krishnan, R. M., Beelen, R., Peters, A., Ostro, B., Brunekreef, B., and Kaufman, J. D. 2013. Long-term air pollution exposure and cardio-respiratory mortality: a review. *Environmental Health*, 12(1), 1.

190 Friedman, M. S., K. E. Powell, L. Hutwagner, L. M. Graham, and W. G. Teague. 2001. "Impact of changes in transportation and commuting behaviors during the 1996 Summer Olympic Games in Atlanta on air quality and childhood asthma." *JAMA* 285(7), 897–905.

191 Bell, M. L., and K. Ebisu. 2012. "Environmental inequality in exposures to airborne particulate matter components in the United States." *Environmental Health Perspectives* 120(12), 1699.

192 Morello-Frosch, R., M. Zuk, M. Jerrett, B. Shamasunder, and A. D. Kyle. 2011. "Understanding the cumulative impacts of inequalities in environmental health: implications for policy." *Health Affairs* 30(5), 879–887.

193 H + T@ Index website. htaindex.cnt.org/

194 For example, a recent report by the American Lung Association estimates the costs of climate and air pollution from passenger vehicles in California to be \$15 billion annually. Holmes-Gen, B. and W. Barrett. 2016. Clean Air Future – Health and Climate Benefits of Zero Emission Vehicles. American Lung Association in California, October.

action on ZEVs. Therefore, CARB is signaling the need for additional policy and technical support on strategies to move toward a goal of achieving 100 percent ZEV sales in the light-duty vehicle sector. Austria, Germany, India, Netherlands, and Norway are all taking steps to, or have indicated a desire to, move to 100 percent ZEV sales in the 2020–2030 time frame.

In addition, policies that maximize the integration of electrified rail and transit to improve reliability and travel times, increase active transportation such as walking and bicycling, encourage use of streets for multiple modes of transportation, improve freight efficiency and infrastructure development, and shift demand to low carbon modes will need to play a greater role as California strives to achieve its 2030 and 2050 climate targets.¹⁹⁵

The State's rail modernization program has identified critical elements of the rail network where improvements, either in timing of service or infrastructure, provide benefits across the entire statewide network, furthering the attractiveness of rail for a range of trip distances.¹⁹⁶ The State also uses the Transit and Intercity Rail Capital Program (TIRCP) and Low Carbon Transit Operations Program (LCTOP) to provide grants from GGRF to fund transformative improvements modernizing California's intercity, commuter, and urban rail systems, as well as bus and ferry transit systems, to reduce emissions of GHGs by reducing congestion and VMT throughout California. As the backbone of an electrified mass-transportation network for the State, the high-speed rail system catalyzes and relies on focused, compact, and walkable development well-served by local transit to funnel riders onto the system and provide alternative options to airplanes and automobiles for interregional travel. Concentrated development, such as that incentivized by the Affordable Housing and Sustainable Communities (AHSC) grant program, can improve ridership and revenue for the system while providing vibrant communities for all.

At the same time, more needs to be done to fully exploit synergies with emerging mobility solutions like ride-sourcing and more effective infrastructure planning to anticipate and guide the necessary changes in travel behavior, especially among millennials. Uniquely, high-speed rail affects air-miles traveled, diverting, at minimum, 30 percent of the intrastate air travel market in 2040.¹⁹⁷

While most of the GHG reductions from the transportation sector in this Scoping Plan will come from technologies and low carbon fuels, a reduction in the growth of VMT is also needed. VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals.

At the time of this writing, adoption of the first round of SCSs by MPOs is complete, and the second round of SCS planning is underway. Three MPO regions are in the very early stages of developing their third SCSs. To date, CARB staff reviewed the final determinations of 16 MPOs, and concluded that all 16 of those SCSs would achieve their targets, if implemented, with many of the MPOs indicating that they expect to exceed their targets. CARB staff recognizes the very strong performance in this first round of SCSs as a major success. Currently adopted sustainable communities strategies achieve, in aggregate, a 17 percent reduction in statewide per capita GHG emissions relative to 2005 by 2035.

Since 2014, CARB has been working with MPOs and other stakeholders to update regional SB 375 targets. At the same time, CARB has also conducted analysis for development of the Mobile Source Strategy and Scoping Plan that identifies the need for statewide per capita greenhouse gas emissions reductions on the order of 25 percent by 2035, to meet our climate goals. Many MPOs have identified challenges to incorporating additional strategies and reducing emissions further in their plans, principally tied to the need for additional and more flexible revenue sources. MPOs have submitted target update recommendations to CARB that in aggregate maintains a 17 percent reduction statewide, which includes commitments of 18 percent reduction by 2035 from each of the four largest MPOs in the State.

CARB is currently reviewing each MPOs target update recommendations alongside new State policies. State agencies have been working on new State-level VMT-related Policies and Measures (see Table 17) as part of this Scoping Plan intended to provide the State, MPOs, and local agencies with additional funding resources and tools to successfully meet the State's climate goals. CARB's preliminary review indicates that new State-level policies and measures will help support updated SB 375 targets that achieve up to 20 percent of the

195 Morello-Frosch, R., M. Zuk, M. Jerrett, B. Shamasunder, and A. D. Kyle. 2011. "Understanding the cumulative impacts of inequalities in environmental health: Implications for policy." *Health Affairs* 30(5), 879–887.

196 California State Transportation Agency. 2016. 2018 California State Rail Plan factsheet and TIRCP fact sheet.

197 California High-Speed Rail Authority. 2016. 2016 Business Plan. Ridership and Revenue Forecast.

needed statewide reduction, as well as help bridge the remaining VMT growth reduction gap.

Discussions among a broad suite of stakeholders from transportation, the building community, financial institutions, housing advocates, environmental organizations, and community groups are needed to begin the process to pursue and develop the needed set of strategies to ensure that we can achieve necessary VMT reductions, and that the associated benefits are shared by all Californians. Appendix C further details potential actions for discussion that can be taken by State government, regional planning agencies, and local governments, to achieve a broad, statewide vision for more sustainable land use and close the VMT gap.¹⁹⁸

At the State level, a number of important policies are being developed. Governor Brown signed Senate Bill 743 (Steinberg, Chapter 386, Statutes of 2013), which called for an update to the metric of transportation impact in CEQA. That update to the CEQA Guidelines is currently underway. Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375. The State can provide guidance and tools to assist local governments in achieving those objectives.

Appendix H highlights the more significant existing policies, programs, measures, regulations, and initiatives that provide a framework for helping achieve GHG emissions reductions in this sector.

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Vibrant Communities and Landscapes / VMT Reduction Goals

- Implement and support the use of VMT as the metric for determining transportation impacts under CEQA, in place of level of service (LOS).
- Promote all feasible policies to reduce VMT, including:
 - Land use and community design that reduce VMT,
 - Transit oriented development,
 - Complete street design policies that prioritize transit, biking, and walking, and
 - Increasing low carbon mobility choices, including improved access to viable and affordable public transportation and active transportation opportunities.
- Complete the construction of high-speed rail integrated with enhanced rail and transit systems throughout the State.
- Promote transportation fuel system infrastructure for electric, fuel-cell, and other emerging clean technologies that is accessible to the public where possible, and especially in underserved communities, including environmental justice communities.
- Increase the number, safety, connectivity, and attractiveness of biking and walking facilities to increase use.
- Promote potential efficiency gains from automated transportation systems and identify policy priorities to maximize sustainable outcomes from automated and connected vehicles (preferably ZEVs), including VMT reduction, coordination with transit, and shared mobility, and minimize any increase in VMT, fossil fuel use, and emissions from using automated transportation systems.
- Promote shared-use mobility, such as bike sharing, car sharing and ride-sourcing services to bridge the “first mile, last mile” gap between commuters’ transit stops and their destinations.
- Continue research and development on transportation system infrastructure, including:
 - Integrate frameworks for lifecycle analysis of GHG emissions with life-cycle costs for pavement and large infrastructure projects, and
 - Health benefits and costs savings from shifting from driving to walking, bicycling, and transit use.
- Quadruple the proportion of trips taken by foot by 2030 (from a baseline

¹⁹⁸ CARB. Potential State - Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT) -- for Discussion. www.arb.ca.gov/cc/scopingplan/meetings/091316/Potential%20VMT%20Measures%20For%20Discussion_9.13.16.pdf

- of the 2010–2012 California Household Travel Survey).
- Strive for a nine-fold increase in the proportion of trips taken by bicycle by 2030 (from a baseline of the 2010–2012 California Household Travel Survey).
- Strive, in passenger rail hubs, for a transit mode share of between 10 percent and 50 percent, and for a walk and bike mode share of between 10 percent and 15 percent.

Vehicle Technology Goals

- Through a strong set of complementary policies—including reliable incentives, significant infrastructure investment, broad education and outreach, and potential regulation—aim to reach 100 percent ZEV sales in the light-duty sector (PHEVs, BEVs, and FCEVs) by 2050.
- Make significant progress in ZEV penetrations in non-light-duty sectors.
- Deploy low-emission and electrified rail vehicles.

Clean Fuels Goals

- Electrify the transportation sector using both electricity and hydrogen.
- Promote research development and deployment of low carbon fuels such as renewable gas, including renewable hydrogen.
- Rapidly reduce carbon intensity of existing liquid and gaseous transportation fuels.

Sustainable Freight Goals

- Increase freight system efficiency of freight operations at specific facilities and along freight corridors such that more cargo can be moved with fewer emissions.
- Accelerate use of clean vehicle and equipment technologies and fuels of freight through targeted introduction of zero emission or near-zero emission (ZE/NZE) technologies, and continued development of renewable fuels.
- Encourage State and federal incentive programs to continue supporting zero and near-zero pilot and demonstration projects in the freight sector.
- Accelerate use of clean vehicle, equipment, and fuels in freight sector through targeted introduction of ZE/NZE technologies, and continued development of renewable fuels. This includes developing policy options that encourage ZE/NZE vehicles on primary freight corridors (e.g., Interstate-710); examples of such policy options include a separated ZE/NZE freight lane, employing market mechanisms such as favorable road pricing for ZE/NZE vehicles, and developing fuel storage and distribution infrastructure along those corridors.

Cross-Sector Interactions

The transportation sector has considerable influence on other sectors and industries in the State. California's transportation sector is still primarily powered by petroleum, and to reduce statewide emissions, California must reduce demand for driving; continue to reduce its gasoline and diesel fuel consumption; diversify its transportation fuel sources by increasing the adoption of low- and zero-carbon fuels; increase the ease and integration of the rail and transit networks to shift travel mode; and deploy ZE/NZE vehicles.

As California's population continues to increase, land use patterns will directly impact GHG emissions from the transportation sector, as well as those associated with the conversion and development of previously undeveloped land. Specifically, where and how the State population grows will have implications on distances traveled and tailpipe emissions; as well as on secondary emissions from the transportation sector, including emissions from vehicle manufacturing and distribution, fuel refining and distribution, demand for new infrastructure (including roads, transit, and active transportation infrastructure), demand for maintenance and upkeep of existing infrastructure. Conversion of natural and working lands further affects emissions, with the attendant impacts to food security, watershed health, and ecosystems. Less dense development also demands higher energy and water use. With the exception of VMT reductions, none of these secondary emissions are currently accounted for in the GHG models used in this Scoping Plan, but are nonetheless important considerations. Additionally, compact, lower-VMT future development patterns are essential to achieving public health, equity, economic, and conservation goals, which are also not modeled but are important co-benefits of the overall transportation sector strategy. For example, high-speed rail station locations were identified in downtown areas to reinforce existing city centers.

Achieving LCFS targets and shifting from petroleum dependence toward greater reliance on low carbon fuels also has the potential to affect land use in multiple ways. For example, increased demand for conventional biofuels could require greater use of land and water for purpose-grown crops, which includes interactions with the agricultural and natural and working lands sectors. On the other hand, continuing growth in fuels from urban organic waste, as well as waste biomass such as composting residues, by-processing residues and agricultural waste and excess forest biomass acts to alleviate the pressure on croplands to meet the need for food, feed, and fuel. Likewise, captured methane from in-vessel digestion, landfills or dairy farms for use in vehicles requires close interaction with the waste and farming sectors.

Also, as more electric vehicles and charging stations are deployed, drivers' charging behavior will affect the extent to which additional electric generation capacity and ancillary services are needed to maintain a reliable grid and accommodate a portfolio of 50 percent renewable electricity by 2030. Charging control and optimization technologies will determine how well integrated the electric and transportation sectors can become, including, for instance, the widespread use of electric vehicles as storage for excess renewable generation, vehicle to grid, smart charging, and/or smart grid. The GHG emissions intensity of electricity affects the GHG savings of fuel switching from petroleum-based fuels to electricity; the cleaner the electric grid, the greater the benefits of switching to electricity as a fuel. Similar to electric vehicles, hydrogen fuel cell electric vehicles have zero-tailpipe emissions and can mitigate GHGs and criteria pollutants. Greenhouse gas emissions could be further reduced with the use of renewable hydrogen, which can be produced using renewable electricity or renewable natural gas.

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for the transportation sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit.

Ongoing and Proposed Measures – Vibrant Communities and Landscapes / VMT Reduction Goals

- Mobile Source Strategy – 15 percent reduction in total light-duty VMT from the BAU in 2050 (with measures to achieve this goal not specified; potential measures identified in Appendix C).
- Work with regions to update SB 375 Sustainable Communities Strategies targets for 2035 to better align with the 2030 GHG target and take advantage of State rail investments.
- Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward the goal of reducing total light-duty VMT by 15 percent from expected levels in 2050, but alone will not provide all of the VMT reductions that will be needed. The gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals needs to be addressed through additional VMT reduction measures such as those mentioned in Appendix C.
- Implement and support the adoption and use of VMT as the CEQA metric of transportation impact, such that it promotes GHG reduction, the development of multimodal transportation networks, and a diversity of land uses.
- Continue to develop and explore pathways to implement State-level VMT reduction strategies, such as those outlined in the document "Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT) – for Discussion"¹⁹⁹ – included in Appendix C – through a transparent and inclusive interagency policy development process to evaluate and identify implementation pathways for additional policies to reduce VMT and promote sustainable communities, with a focus on:
 - Accelerating equitable and affordable transit-oriented and infill development through new and enhanced financing and policy incentives and mechanisms,
 - Promoting stronger boundaries to suburban growth through enhanced support for sprawl containment mechanisms such as urban growth boundaries and transfer of development rights programs,
 - Identifying performance criteria for transportation and other infrastructure investments

¹⁹⁹ Refers to the document discussed at the September 2016 Public Workshop on the Transportation Sector to Inform Development of the 2030 Target Scoping Plan Update, also available at: www.arb.ca.gov/cc/scopingplan/meetings/091316/Potential%20VMT%20Measures%20For%20Discussion_9.13.16.pdf

- to ensure alignment with GHG reduction goals and other State policy priorities and expand access to transit, shared mobility, and active transportation choices,
- Promoting efficient development patterns that maximize protection of natural and working lands,
- Developing pricing mechanisms such as road user/VMT-based pricing, congestion pricing, and parking pricing strategies,
- Reducing congestion and related GHG emissions through commute trip reduction strategies, and
- Programs to maximize the use of alternatives to single-occupant vehicles, including bicycling, walking, transit use, and shared mobility options.
- Finalize analysis of the results of the pilot road usage charge program, implemented pursuant to SB 1077 (DeSaulnier, Chapter 835, Statutes of 2014), and evaluate deployment of a statewide program.
- Continue promoting active transportation pursuant to SB 99 (Committee on Budget and Fiscal Review, Chapter 359, Statutes of 2013) – The Active Transportation Program and beyond.
- Continue to build high-speed rail and broader statewide rail modernization pursuant to the funding program in SB 862 (Committee on Budget and Fiscal Review, Chapter 36, Statutes of 2014) and other sources.
- Encourage use of streets for multiple modes of transportation (including public transit and active transportation, such as walking and bicycling), and for all users, including the elderly, young, and less able bodied, pursuant to AB 1358 (Leno, Chapter 657, Statutes of 2008) – Complete Streets policies.
- Support and assist local and regional governments, through technical assistance, and grant and other local assistance programs, to develop and implement plans that are consistent with the goals and concepts in The Second Investment Plan for Fiscal Years 2016-2017 through 2018-2019²⁰⁰ and its subsequent updates, and Appendix C: Vibrant Communities and Landscapes, including the following:
 - California Climate Investment programs such as Transformative Climate Communities Program, ensuring promotion of GHG reductions from neighborhood-level community plans in disadvantaged communities.
 - AB 2087 (Levine, Chapter 455, Statutes of 2016) – Help local and State agencies apply core investment principles when planning conservation or mitigation projects.
 - High speed rail station area plans.
 - Implementation of updated General Plan Guidelines.
- Per SB 350, implement the recommendations identified in the Barriers Study to accessing ZE/NZE transportation options for low-income customers and recommendations on how to increase access.²⁰¹ And, track progress towards these actions over time to ensure disadvantaged communities are getting equal access and benefits relative to other parts of the State.
- Take into account the current and future impacts of climate change when planning, designing, building, operating, maintaining, and investing in State infrastructure, as required under Executive Order B-30-15.

Ongoing and Proposed Measures – Vehicle Technology

- Implement the Cleaner Technology and Fuels Scenario of CARB’s Mobile Source Strategy, which includes:
 - An expansion of the Advanced Clean Cars program, which further increases the stringency of GHG emissions for all light-duty vehicles, and 4.2 million zero emission and plug-in hybrid light-duty electric vehicles by 2030,
 - Phase 1 and 2 GHG regulations for medium- and heavy-duty trucks, and
 - Innovative Clean Transit.
- Periodically assess and promote cleaner fleet standards.
- Deploy ZEVs across all vehicle classes, including rail vehicles, along with the necessary charging infrastructure.
- Encourage State and federal incentive programs to continue supporting zero and near-zero pilot and demonstration projects.
- Collaborate with the U.S. Environmental Protection Agency to promulgate more

200 CARB. January 2016. Cap-and-Trade Auction Proceeds Second Investment Plan: Fiscal Years 2016-17 through 2018-19. Available at: www.arb.ca.gov/cc/capandtrade/auctionproceeds/16-17-updated-final-second-investment-planii.pdf

201 CARB. 2017. Low-Income Barriers Study, Part B: Overcoming Barriers to Clean Transportation Access for Low Income Residents. www.arb.ca.gov/msprog/transoptions/draft_sb350_clean_transportation_access_guidance_document.pdf

stringent locomotives requirements,²⁰² work with California seaports, ocean carriers, and other stakeholders to develop the criteria to incentivize introduction of Super-Low Emission Efficient Ships, and investigate potential energy efficiency improvements for transport refrigeration units and insulated truck and trailer cargo vans.

- Promote research, development, and deployment of new technology to reduce GHGs, criteria pollutants, and toxics.
- Implement a process for intra-state agency and regional and local transportation coordination on automated vehicles to ensure shared policy goals in achieving safe, energy efficient, and low carbon autonomous vehicle deployment that also contribute to VMT reductions.

Ongoing and Proposed Measures – Clean Fuels

- Continue LCFS activities, with increasing stringency of at least 18 percent reduction in carbon intensity (CI).
- Continue to develop and commercialize clean transportation fuels through renewable energy integration goals, tax incentives, research investments, support for project demonstration, public outreach, setting procurement standards, including updating State and local procurement contracts.
- Per SB 1383 and the SLCP Strategy, adopt regulations to reduce and recover methane from landfills, wastewater treatment facilities, and manure at dairies; use the methane as a source of renewable gas to fuel vehicles and generate electricity; and establish infrastructure development and procurement policies to deliver renewable gas to the market.
- Accelerate deployment of alternative fueling infrastructure pursuant to the following:
 - SB 350 – CPUC to accelerate widespread transportation electrification.
 - Executive Order B-16-2012 and 2016 ZEV Action Plan – call for infrastructure to support 1 million ZEVs by 2020.
 - CEC’s Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP).
 - CPUC’s NRG settlement.
 - CALGreen Code provisions mandate installation of PEV charging infrastructure in new residential and commercial buildings.²⁰³
 - IOU electric vehicle charging infrastructure pilot programs.

Ongoing and Proposed Measures – Sustainable Freight

- Implement the California Sustainable Freight Action Plan:
 - 25 percent improvement of freight system efficiency by 2030.
 - Deployment of over 100,000 freight vehicles and equipment capable of zero emission operation, and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030.

Ongoing and Proposed Measures – California and Transportation Plan

- Update every five years and implement California Transportation Plan.

Sector Measures

- Implement the post-2020 Cap-and-Trade Program

Potential Additional Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

- Develop a set of complementary policies to make light-duty ZEVs clear market winners, with a goal of reaching 100 percent light-duty ZEV sales. This could include the following:
 - Reliable purchase/trade-in incentives for at least 10 years.
 - Dealer incentives for ZEV sales.
 - Policies to ensure operating cost savings for ZEVs relative to internal

²⁰² www.arb.ca.gov/railyard/docs/final_locomotive_petition_and_cover_letter_4_13_17.pdf

²⁰³ Such as raceway and panel capacity to support future installation of electrical vehicle charging stations.

- combustion engines, including low cost electricity.
- Additional investments in charging and ZEV refueling infrastructure.
- A broad and effective marketing and outreach campaign.
- Collaborations with cities to develop complementary incentive and use policies for ZEVs.
- Targeted policies to support ZEV sales and use in low income and disadvantaged communities.
- Develop a Low-Emission Diesel Standard to diversify the fuel pool by incentivizing increased production of low-emission diesel fuels. This standard is anticipated to both displace consumption of conventional diesel with increased use of low-emission diesel fuels, and to reduce emissions from conventional fuels.
- Continue to develop and explore pathways to implement State-level VMT reduction strategies, such as those outlined in Appendix C through a transparent and inclusive interagency policy development process to evaluate and identify implementation pathways for additional policies to reduce VMT and promote sustainable communities, with a focus on the following:
 - Accelerating equitable and affordable transit-oriented and infill development through new and enhanced financing and policy incentives and mechanisms.
 - Promote infrastructure necessary for residential development in existing communities, and ensure any urban growth boundaries are paired with significant infill promotion strategies and removal of infill development barriers.
 - Identifying performance criteria for transportation and other infrastructure investments, to ensure alignment with GHG reduction goals and other State policy priorities, and improve proximity, expanded access to transit, shared mobility, and active transportation choices.
 - Promoting efficient development patterns that maximize protection of natural and working lands.
 - Developing pricing mechanisms such as road user/VMT-based pricing, congestion pricing, and parking pricing strategies.
 - Reducing congestion and related GHG emissions through programs to maximize the use of alternatives to single-occupant vehicles, including bicycling, walking, transit use, and shared mobility options for commute trips.
- Continue to promote research and standards for new and existing technologies to reduce GHGs, including but not limited to:
 - Low rolling resistance tires in the replacement tire market, subject to certification standards that identify tires as low rolling resistance tires or verify emissions reductions and potential fuel savings.
 - Impacts on VMT of car sharing, ride-sourcing, and other emerging mobility options.
 - Driving behaviors that reduce GHG emissions, such as ecodriving training and real-time feedback mechanisms.

Natural and Working Lands Including Agricultural Lands

In his 2015 State of the State address, Governor Brown established 2030 targets for GHG emissions reductions and called for policies and actions to reduce GHG emissions from natural and working lands, including forests, rangelands, farms, wetlands, and soils. The passage of SB 1386 (Wolk, Chapter 535, Statutes of 2015-16) codified this policy and emphasized the important role natural and working lands play in the State's climate strategy. This Scoping Plan focuses renewed attention on California's natural and working lands and the contribution they make to meet the State's goals for carbon sequestration, GHG reduction, and climate change adaptation.

California's natural and working lands encompass a range of land types and uses, including farms, ranches, forests, grasslands, deserts, wetlands, riparian areas, coastal areas and the ocean-- as well as the green spaces in urban and built environments. These resources can be both a source and sink for GHG emissions. Policy in this sector must balance GHG emissions reductions and carbon sequestration with other co-benefits, such as clean air, wildlife and pollinator habitat, strong economies, food, fiber and renewable energy production, and water supply.²⁰⁴

Recent trends indicate that significant pools of carbon from these landscapes risk reversal: over the period 2001–2010 disturbance caused an estimated 150 MMT C loss, with the majority— approximately 120 MMT C—

204 www.sierranevada.ca.gov/our-region/ca-primary-watershed

lost through wildland fire.²⁰⁵ At the same time, energy use, methane, and N₂O emissions from the agricultural sector accounts for eight percent of the emissions in the statewide GHG inventory.

California's climate objective for natural and working lands is to maintain them as a carbon sink (i.e., net zero or negative GHG emissions) and, where appropriate, minimize the net GHG and black carbon emissions associated with management, biomass utilization, and wildfire events. In order to achieve this objective, this Plan directs the continued development of the broad and growing understanding of carbon dynamics on California's landscapes, statewide emission trends, and their responses to different land management scenarios. Further, in order to build a programmatic framework for achieving this long-term objective to maintain California's natural and working lands as a carbon sink, this Plan directs the State to quantify the carbon impacts of both publicly funded (e.g., bonds, special taxes, general fund) climate intervention activities on California's natural and working lands made through existing programs as well as potential regulatory actions on land management. This Plan proposes an intervention based reduction goal of at least 15-20 million metric tons by 2030 as a reasonable beginning point for further discussion and development based on the State's current preliminary understanding of what might be feasible. This Plan recognizes that achieving an initial statewide goal of sequestering and avoiding emissions in this sector by at least 15-20 million metric tons by 2030 through existing pathways and new incentives would provide a crucial complement to the measures described in this Scoping Plan and will inform the development of longer-term natural and working lands goals. Achieving this ambitious climate goal will require collaboration and support from State and local agencies, which must improve their capacity to participate and benefit from State climate programs, and set the path for natural and working lands to help the State meet its long-range climate goals.

Looking to the Future

This section outlines how the State will achieve California's climate objectives to: (1) maintain them as a resilient carbon sink (i.e., net zero or negative GHG emissions), and (2) minimize the net GHG and black carbon emissions associated with management, biomass disposal, and wildfire events to 2030 and beyond.

Implementation will include policy and program pathways, with activities related to land protection; enhanced carbon sequestration; and innovative biomass utilization. The framework for this section is to:

- **Protect** land from conversion to more intensified uses by increasing conservation opportunities and pursuing local planning processes in urban and infrastructure development patterns that avoid greenfield development.
- **Enhance** the resilience of and potential for carbon sequestration on lands through management and restoration, and reduce GHG and black carbon emissions from wildfire and management activities. This enhancement includes expansion and management of green space in urban areas.
- **Innovate** biomass utilization such that harvested wood and excess agricultural and forest biomass can be used to advance statewide objectives for renewable energy and fuels, wood product manufacturing, agricultural markets, and soil health, resulting in avoided GHG emissions relative to traditional utilization pathways. Associated activities should increase the resilience of rural communities and economies.

To accomplish these objectives, the State, led by California Natural Resources Agency (CNRA), California Department of Food and Agriculture (CDFA), California Environmental Protection Agency (CalEPA) and CARB will complete a Natural and Working Lands (NWL) Climate Change Implementation Plan (Implementation Plan) in 2018 to evaluate a range of implementation scenarios for natural and working lands and identify long-term (2050 or 2100) sequestration goals that can be incorporated into future climate policy. The Implementation Plan will:

- Include a projection of statewide emissions under business-as-usual land use and management conditions and alternative scenarios, as well as a listing and quantitative assessment of conservation and management activities the state may pursue to achieve the NWL climate objectives and the statewide goals of at least 15-20 MMTCO₂e emissions sequestering and avoidance from the NWL sector by 2030;
- Identify state departments, boards, conservancies, and CNRA and CDFA programs responsible for meeting the 15-20 MMTCO₂e goal by 2030; and
- Identify methodologies to be used by State programs to account for the

²⁰⁵ www.arb.ca.gov/cc/inventory/sectors/forest/forest.htm

GHG impacts of prior state funded land use and management interventions, and to be used to estimate the GHG impacts of future interventions.

While growing trees and other vegetation, as well as soil carbon sequestration, reduce some of the carbon losses measured, climate change itself further stresses many of these systems and affects the ability of California's landscapes to maintain its carbon sink. The State will continue to rely on best available science to support actions and incentives to slow and reverse these trends, in concert with other production and ecological objectives of land use. The Forest Climate Action Team, Healthy Soils Initiative, State Coastal Conservancy's Climate Ready Program, various California Climate Investment programs, and CARB's compliance offset program already undertake portions of this work. As we move towards and maximize the ability of our land base to serve as a carbon sink, it will also be important to strengthen these individual activities through the coordination and aggregation of ecoregional plans that inform these interventions. These and future additional efforts can not only protect California's natural carbon stocks, they can also improve quality of life in urban and rural communities alike and increase the climate resilience of agricultural, forestry, and recreational industries and the rural communities they support; the State's water supply; biodiversity; and the safety and environmental health of all who call California home.

Research and Policy Needs

Research is ongoing across agencies to advance the state of the science on NWL carbon dynamics, including a number of projects within the Fourth Climate Change Assessment, and a compendium of climate research being managed by the CNRA that will be completed in 2018. Additionally, California needs a well-defined reference case, or "business as usual" scenario to set a comprehensive and strategic path forward for California's lands and ocean environments to contribute to the State's climate goals. Finally, efforts must increase to gather, interpret, and unify best available science on the GHG and carbon sequestration impacts of land use and management practices applied across forests, cultivated agricultural lands, rangelands and grasslands, wetlands, coastal and ocean systems, desert ecosystems, and urban and other settled lands.

The Implementation Plan, as summarized above, will utilize the Protect-Enhance-Innovate framework and employ projections for carbon sequestration and GHG emissions from California's land base under reference case and increased management scenarios. The quantitative outputs of these projections, expressed as carbon dioxide equivalents will drive acreage needs for implementation using CO₂e/acre results from multiple modeling efforts. The Implementation Plan will also identify GHG emissions quantification within and across programs and agencies and describe implementation monitoring and emissions inventories.

Natural and Working Lands Inventory

In order to understand how carbon is released and sequestered by natural and working landscapes, CARB has worked extensively with other State agencies, academic researchers and the public to develop a Natural and Working Lands inventory that will guide this process. As with other sectors, the CARB Natural and Working Lands inventory represents a snapshot of emissions in recent years, using a combination of reported and measured data. A time lag exists between the last year of available data and the completion of the inventory to allow time for reporting and processing the data. For emission sources that are hard to individually measure, the CARB inventory estimates emissions based on "surrogates," such as the typical amount of travel on unpaved roads to estimate particulate matter emissions at the county level. The most recent inventory can also be "forecast" to project prevailing conditions in a future year based on rules and programs currently in place – known as a "business as usual projection" - along with scenarios to explore the benefits of further strategies to reduce emissions. Forecasts of business-as-usual and policy scenarios guide planning efforts.

As discussed below, ongoing research into forecasting emissions from Natural and Working Lands includes a project at Lawrence Berkeley National Laboratory funded by CNRA. CARB is monitoring this and other research activities and will incorporate results into a proposed inventory and forecasting methodology for Natural and Working Lands. CARB will solicit public feedback and review on the resulting product prior to completing the first full Natural and Working Lands Inventory by the end of 2018, as called for in SB 859. The Natural and Working Lands Inventory is spatially-resolved, so it can be segmented by county, watershed, or other regional planning areas. This spatial resolution allows local governments and regional organizations to use the inventory, along with more granular location-specific information, to track progress from projects in their jurisdictions.

CARB plans to update the forest component of the Natural and Working Lands inventory to include 2012 GHG emissions estimates, followed by emissions estimates for soil carbon, urban forestry, and croplands by mid-2018. Work currently in progress applies airborne and space-based technologies to monitor forest health and quantify emissions associated with land-based carbon. California and federal agencies are working with researchers and funding studies to enhance our understanding of the roles of forests and other lands in climate change using rapidly advancing remote sensing technology.^{206, 207}

CALAND Carbon Emissions Model

CNRA is managing the development of a CALAND model through Lawrence Berkeley National Laboratory, which will include a projection of business-as-usual emissions as well as a listing and quantitative assessment of conservation and management activities the State may pursue to achieve at least 15-20 MMT sequestration and GHG avoided emissions from the NWL sector by 2030.

CNRA, along with CARB and CDFA, will establish a formal public engagement process to gather external scientific expertise to inform development and finalization of the CALAND model for use in the Implementation Plan. Development of the Implementation Plan itself will also include a formal public process.

Cross-Sector Interactions

Strategies that reduce GHG emissions or increase sequestration in the natural and working lands sector often overlap and result in synergies with other sectors, most notably at intersections with land use, biomass and waste utilization, energy and water. It will be important for the sector to make critical linkages to other sectors, including energy, transportation fuels, and waste, and develop plans to integrate the natural and working lands sector into existing models, such as PATHWAYS and REMI.

Landowner, local, and regional decisions affect land use development patterns and natural and working land conversion rates; conversely, conservation activities can support infill-oriented regional development and related transportation needs. As discussed earlier in the Transportation Sustainability section, under SB 375, Sustainable Communities Strategies (SCSs) aim to link transportation, housing, and climate policy to reduce per capita GHG emissions while providing a range of other important benefits for Californians. Some SCSs include policies, objectives or implementation measures relating to conservation and land protections, and to urban greening.²⁰⁸ Protecting natural and working lands that are under threat of conversion can promote infill development, reduce VMT, limit infrastructure expansion, and curb associated GHG emissions. An integrated vision for community development, land conservation and management, and transportation is a key component of meeting our transportation and natural and working lands goals.²⁰⁹

Agricultural and commercial forestry operations produce biomass as both an objective (i.e., food and fiber production) and a waste by-product. How this material is utilized can either increase or decrease emissions associated with management and restoration activities, turn waste into usable products, displace fossil fuels used in energy and transportation, and increase carbon stored in durable wood products in the built environment. Finding productive ways to use this material offers new opportunities to reduce GHG emissions, promote carbon sequestration, and generate economic resources for forest, agricultural, and waste sectors and communities. California is investigating ways to transform how organic waste from the agricultural and municipal sectors is managed to meet SLCP emissions reductions targets required by SB 1383,²¹⁰ and to protect public health. Cross-sector synergies and complete waste inter-cycles, discussed further in the Waste Management section, result from conscientious treatment of these resources, including opportunities to improve soil health, increase renewable energy generation, and enhance market support for non-commercial products and waste. Productive utilization of dead and dying trees is a significant focus of the Governor's Tree Mortality Task Force, and efforts to resolve the current shortfall in utilization capacity is addressed in that State of Emergency Declaration as well as in SB 859.

Natural and working lands stewardship is essential to securing the State's water supply along the entire

206 Asner, G. et al. (2015) Progressive forest canopy water loss during the 2012–2015 California drought. PNAS 113.2: E249-E255

207 Battles, J. et al. (in progress) Innovations in measuring and managing forest carbon stocks in California. Project 2C: 4th California Climate Change Assessment. Natural Resources Agency. resources.ca.gov/climate/fourth/

208 Livingston, Adam. Sustainable Communities Strategies and Conservation. January 2016. Available at: www.nature.org/ourinitiatives/regions/northamerica/unitedstates/california/sustainable-communities-strategies-and-conservation.pdf

209 www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm

210 SB1383 (Lara, Chapter 396, Statutes of 2016) requires a 50 percent reduction in anthropogenic black carbon emissions by 2030.

supply chain, from protection and management of the forested headwaters to preserving the ability of mountain meadows to retain and filter water ensuring flows and habitat in the Delta and its tributaries, end use efficiencies in agricultural and urban uses, and groundwater infiltration and utilization statewide. For example, more efficient water and energy use in farming operations could support GHG emissions reductions goals in the energy sectors. And improving forest health in the Sierra Nevada, Cascades, and other headwaters protects water quality and availability, in alignment with the California Water Action Plan.

Potential Actions to Enhance Carbon Sequestration and Reduce Greenhouse Gases in NWL

While agricultural and forest lands comprise the greatest acreage of NWL statewide, representing significant opportunity for achieving the State's NWL climate goals, actions on all NWL remain critical. The land management strategies and targets included in these sections are illustrative of the types of actions that will be necessary to maintain all of California's NWL and urban green space as a net sink of carbon, and are being used to aid in development of scenario modeling. The Implementation Plan will use this scenario modeling to scope the scale of action needed to ensure resilient future landscapes and identify key areas for advancement.

Agriculture's Role in Emissions Reductions and Carbon Sequestration

In 2030 and 2050, the agricultural sector must remain vibrant and strong. California's agricultural production is critical to global food security. It is also vulnerable to climate change. A study²¹¹ by the University of California concluded that the drought in 2015 cost the state economy \$2.7 billion and 21,000 full time jobs. These losses are expected to ripple through rural communities for another several years. This illustrates the importance of strengthening agriculture while protecting resources and mitigating climate change.

As the State works to meet emissions reductions goals, the agricultural sector can reduce emissions from production, sequester carbon and build soil carbon stocks, and play a role in cross-sectoral efforts to maximize the benefits of natural and working lands.

Climate-smart agriculture is an integrated approach to achieving GHG reductions while also ensuring food security and promoting agricultural adaptation in the face of climate change. Conserving agricultural land, sequestering carbon in agricultural soils, employing a variety of techniques to manage manure on dairies, and increasing the efficiency of on-farm water and energy use are examples of practices that can achieve climate and food production goals across diverse agricultural systems. Climate-smart agriculture can support the Protect, Enhance, and Innovate goals.

Approximately 60 percent of agricultural emissions are methane emissions from the dairy and livestock sectors. Emissions come from the animals themselves, through enteric fermentation, as well as from manure management—especially at dairies. SB 1383 and the resultant SLCP Strategy identify a mix of voluntary, incentive-based, and potential regulatory actions to achieve significant emissions reductions from these sources. A variety of techniques can attain the best results for each specific farming operation; effectively implementing a broad mix of strategies will reduce the GHG emissions from the agricultural sector significantly. CARB and CDFA and other agencies are working together to solicit input from industry, environmental, and community groups to encourage early and meaningful action to reduce emissions from the livestock sector.

Over the last several years, farms have begun to optimize fertilizer applications to protect water quality, maintain high yields, and reduce emissions of N₂O, a greenhouse gas. Farmers are required through the Irrigated Lands Regulatory Program to manage nitrogen fertilizers to protect water quality through the use of nitrogen management plans. Nitrogen management plans are a tool designed to prevent over-applications of nitrogen through an approach that accounts for the nitrogen inputs from water, soil amendments and other sources, and also accounts for nitrogen removed from the field. CDFA's Fertilizer Research and Education Program, in coordination with university researchers and others, has developed fertilization guidelines to optimize the rate, timing and placement of fertilizers for crops that represent more than half of the irrigated agriculture in California. Similarly, innovations in water management and the expansion of high efficiency irrigation methods also are contributing to N₂O reductions.

211 Howitt, Richard E., Duncan MacEwan, Josué Medellín-Azuara, Jay R. Lund, Daniel A. Sumner. 2015. Economic Analysis of the 2015 Drought for California. Davis, CA: Center for Watershed Sciences, University of California – Davis.

California's farms and ranches have the ability to remove carbon from the atmosphere through management practices that build and retain soil organic matter. Adequate soil organic matter ensures the continued soil capacity to function as a vital living ecosystem with multiple benefits, producing food for plants, animals, and humans. The Healthy Soils Initiative, announced by Governor Brown in 2015, offers an opportunity to incentivize the management of farmland for increased carbon sequestration in soil, also augmenting co-benefits including improved plant health and yields, increased water infiltration and retention, reduced sediment erosion and dust, improved water and air quality, and improved biological diversity and wildlife habitat.

SB 859, signed into law in 2016, establishes the Healthy Soils Program at CDFA to provide incentives to farmers. It enables financial support for on-farm demonstration projects that "result in greenhouse gas benefits across all farming types with the intent to establish or promote healthy soils". It defines healthy soils as "soils that enhance their continuing capacity to function as a biological system, increase soil organic matter, improve soil structure and water-and nutrient-holding capacity, and result in net long-term greenhouse gas benefits."

As noted in the Cross-Sector Interactions section, State and local efforts to manage land for carbon sequestration must work in conjunction with existing plans, incentives, and programs protecting California's water supply, agricultural lands, and wildlife habitat. This Scoping Plan fits within a wide range of ongoing planning efforts throughout the State to advance economic and environmental priorities associated with natural and working lands.

The Role of Forests in Emissions Reductions and Carbon Sequestration

Decades of fire exclusion, coupled with an extended drought and the impacts of climate change, have increased the size and intensity of wildfires and bark beetle infestations; exposed millions of urban and rural residents to unhealthy smoke-laden air from wildfires; and threatened progress toward meeting the state's long-term climate goals. Managing forests in California to be healthy, resilient net sinks of carbon is a vital part of California's climate change policy.

More than 100 million trees are dead, and recent wildfires have been among the most destructive and expensive in state history. As many as 15 million acres of California forests are estimated to be unhealthy and in need of some form of restoration, including more than 9 million acres managed by federal land management agencies and 6 million acres of State and privately managed forests.

California's urban forests also face multiple challenges, including drought and invasive exotic insects. Urban forests require maintenance to preserve the multiple values they provide and merit expansion to sequester carbon and secure other benefits to urban dwellers and the State.

The California Forest Carbon Plan (FCP), being developed by the Forest Climate Action Team (FCAT), seeks to establish California's forests as a more resilient and reliable long-term carbon sink, rather than a GHG and black carbon emission source, and confer additional ecosystem benefits through a range of management strategies.²¹² The FCP emphasizes working collaboratively at the watershed or landscape scale to restore resilience to all forestlands in the state.

The current draft of the FCP places carbon sequestration and reducing black carbon and GHG emissions as one set of management objectives in the broader context of forest health and a range of other important forest co-benefits. California will manage for carbon alongside wildlife habitat, watershed protection, recreational access, traditional tribal uses, public health and safety, forest products, and local and regional economic development.

²¹² <http://www.fire.ca.gov/fcat/>

Federally managed lands play an important role in the achievement of the California climate goals established in AB 32 and subsequent related legislation and plans. Over half of the forestland in California is managed by the federal government, primarily by the USDA Forest Service Pacific Southwest Region, and these lands comprise the largest potential forest carbon sink under one ownership in the state. Several regulatory, policy, and financial challenges have hindered the ability of the Forest Service and Department of Interior agencies (Bureau of Land Management and National Park Service) to increase the pace and scale of restoration needed, such as the current budget structure to fund wildland fire suppression and the procedural requirements of a number of federal environmental and planning statutes. The State of California must continue to work closely and in parallel to the federal government's efforts to resolve these obstacles and achieve forest health and resilience on the lands that federal agencies manage.

Protection of Land and Land Use

California will continue to pursue development and new infrastructure construction patterns that avoid greenfield development, limit conflicts with neighboring land uses, and increase conservation opportunities for NWL to reduce conversion to intensified uses. Success will depend on working through local and regional land use planning and permitting, as well as developing incentives for participation by local governments and individual landowners.

Enhance Carbon Sequestration and Resilience through Management and Restoration

California will increase efforts to manage and restore land to secure and increase carbon storage and minimize GHG and black carbon emissions in a sustainable manner so that the carbon bank is resilient and provides other benefits such as water quality, habitat and recreation.

One tool to demonstrate the potential for greater management and restoration on NWL is the CALAND model. As detailed in the Discussion Draft²¹³ and discussed above, it considers a variety of management and restoration activities employed across the State. Version 1 of the CALAND model considered two potential scenarios, a "low" and a "high" rate of implementation to 2030, with resulting carbon sequestration outcomes to 2050. The acreages given in the "low" scenario all represent feasible implementation on public and private lands beyond current rates for the listed activity, given availability of additional funding and other supporting resources. The "high" scenario represents a more ambitious approach, requiring new programs and policies, including collaboration with federal partners, to support implementation.

The activities presented in the Discussion Draft and Version 2 of CALAND are not inclusive of all activities under this strategy. Modeling will continue beyond finalization of the Scoping Plan. Agencies and modelers will continue to identify and analyze land management and restoration activities to advance the State's climate goals and improvements in modeling projections or other quantification protocols.

Management and restoration activities under consideration to help reduce GHG emissions beyond those identified in initial modeling include, but are not limited to the following:

- Forest fuel reduction treatments, reforestation, other restoration activities, prescribed fire and managed ignition.
- Restoration of mountain meadows, managed wetlands in the Sacramento San Joaquin Delta, coastal wetlands and desert habitat.
- Increasing the extent of eelgrass beds.
- Creation and management of parks and other greenspace in urban areas, including expansion of the existing urban tree canopy.
- Implementation of U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) management practices suitable for California agriculture including those practices identified in the Healthy Soils Incentive Program.
- Compost application to irrigated cropland.

Additional potential tools to encourage these activities include working with the federal government to fund more management on federal lands, mitigating for land conversion (as modeled by the High Speed Rail Authority), and revisiting the Forest Practices Act to enhance carbon sequestration benefits associated with timber production activities.

213 www.arb.ca.gov/cc/scopingplan/2030target_sp_dd120216.pdf

Innovate NWL Waste Utilization Pathways

Excess materials generated by commercial agricultural and forestry operations, biomass and wood harvested through forest health and restoration treatments, and material that is generated in response to Tree Mortality Emergency activities, should be used in a manner that minimizes GHG and black carbon emissions and promotes public and environmental health. The Legislature and Governor Brown set an ambitious goal of 75 percent recycling, composting or source reduction of solid waste in landfills by 2020. The State and stakeholders must develop targeted policies or incentives to support durable markets for all of this diverted material. Market opportunities include production of renewable electricity and biofuels, durable wood products, compost and other soil amendments, animal feed and bedding, and other uses. Research, development, and implementation activities in energy, wood products, waste, and soil amendment fields should be spatially-scaled to better link waste generation with infrastructure development.

The goals of this sector, with the potential to reduce GHGs and complement the measures and policies identified in Chapter 2, are described in Looking to the Future. The development of the Implementation Plan will spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

Waste Management

The Waste Management sector covers all aspects of solid waste²¹⁴ and materials management including reduction/reuse; recycling, and remanufacturing of recovered material; composting and in-vessel (anaerobic and aerobic) digestion; biomass management (chip and grind, composting, biomass conversion); municipal solid waste transformation; and landfilling. This sector also includes market development programs, such as the State's recycled-content product procurement program and a range of grant and loan programs. Data from CalRecycle's report, *2014 Disposal Facility-Based Characterization of Solid Waste in California*, shows that materials, such as organics, that decompose in landfills and generate methane comprise a significant portion of the waste stream. Methane is a potent SLCP with a global warming potential 25 times greater than that of carbon dioxide on a 100-year time horizon and more than 70 times greater than that of carbon dioxide on a 20-year time horizon.²¹⁵

Within CARB's greenhouse gas inventory, emissions from the waste management sector consist of methane and nitrous oxide emissions from landfills and from commercial-scale composting, with methane being the primary contributor to the sector's emissions. The sector emitted 8.85 MMTCO₂e in 2014, comprising approximately 2 percent of the State's GHG emissions.

Emissions from recycling and waste have grown by 19 percent since 2000. The majority of those emissions are attributed to landfills, despite the majority of landfills having gas collection systems in place.²¹⁶ Landfill emissions account for 94 percent of the emissions in this sector, while compost production facilities make up a small fraction of emissions.²¹⁷ The annual amount of solid waste deposited in California landfills grew from 37 million tons in 2000 to its peak of 46 million tons in 2005, followed by a declining trend until 2009 when landfilled solid waste stabilized to relatively constant levels. Landfill emissions are driven by the total waste-in-place, rather than year-to-year fluctuation in annual deposition of solid waste, as the rate and volume of gas produced during decomposition depends on the characteristics of the waste and a number of environmental factors. As a result, waste disposed in a given year contributes to emissions that year and in subsequent years.

In addition to direct emissions, the reduction, reuse, and recycling of waste materials decreases upstream GHG emissions associated with the extraction and processing of virgin materials and their use in production and transport of products. Although many of these upstream GHG emissions happen outside of California, California's waste policies can reduce both local and global GHG emissions and create jobs within the State.

214 In general, the term solid waste refers to garbage, refuse, sludges, and other discarded solid materials resulting from residential activities, and industrial and commercial operations. This term generally does not include solids or dissolved material in domestic sewage or other significant pollutants in water such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants.

215 Intergovernmental Panel on Climate Change. 2007. Climate Change 2007: Working Group I: The Physical Science Basis. 2.10.2 Direct Global Warming Potentials. Fourth Assessment Report. www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

216 CARB. 2013. California Greenhouse Gas Inventory for 2000–2013 – by Category as Defined in the 2008 Scoping Draft Plan (based upon IPCC Fourth Assessment Report's Global Warming Potentials).

217 CARB. 2016. 2016 Edition California GHG Emission Inventory. California Greenhouse Gas Emission Inventory: 2000–2014. Version June 17, 2016.

While landfills are an effective and relatively safe way to manage some waste, disposal-centric activities result in squandering valuable resources and generate landfill gases as well as other risks. A large fraction of the organics in the waste stream can be diverted from landfills to composting or digestion facilities to produce beneficial products. Moreover, food waste is the largest component of organics disposed in landfills; a portion of this is edible and should be captured at its source and, for example, provided to food banks to feed people in need. A State waste management sector “loading order” should focus more attention on reducing how much waste we generate and recovering and recycling whatever resources we can, using landfills as a last resort.

Landmark initiatives like the Integrated Waste Management Act of 1989 (AB 939) demonstrate California’s efforts to build communities that consume less, recycle more, and take resource conservation to higher and higher levels. Statewide, Californians achieved a 49 percent recycling rate in 2014, and recycling programs support an estimated 75,000 to 115,000 green jobs in California. If California were to achieve a 75 percent statewide solid waste recycling rate by 2020—a goal set out by the Legislature in AB 341 (Chesboro, Chapter 476, Statutes of 2011)—by recycling and remanufacturing at in-state facilities, the State could potentially generate an additional 100,000 green jobs.²¹⁸ In addition to employment contributions, diversion of organic waste from landfills can generate positive environmental impacts. Compost from organic matter provides soil amendments to revitalize farmland, reduces irrigation and landscaping water demands, contributes to erosion control in fire-ravaged landscapes, and potentially increase long-term carbon storage in rangelands. Production and use of bioenergy in the form of biofuels and renewable natural gas has the potential to reduce dependency on fossil fuels for the transportation sector. For the energy sector, however, renewable natural gas faces safety, feasibility, and cost issues.

The State has a robust waste management system in place, with established programs that reduce air emissions through activities such as gas collection systems from landfills²¹⁹ and stringent recycling mandates. AB 939 required cities and counties to reduce the amount of waste going to landfills by 50 percent in 2000, and municipalities have nearly universally met this mandate. Californians dispose about 30 million tons of solid waste in landfills each year. To further reduce landfilled solid waste, the Legislature adopted AB 341 to achieve more significant waste reductions by setting a goal that 75 percent of solid waste generated be reduced, recycled, or composted by 2020, and by mandating commercial recycling. AB 1826 (Chesboro, Chapter 727, Statutes of 2014) added requirements regarding mandatory commercial organics recycling.

Although solid waste management has evolved over the last 27 years and diversion rates (which include more than recycling) have increased more than six-fold since 1989, if no further changes in policy are made, the State’s growing population and economy will lead to higher amounts of overall disposal along with associated increases in GHG emissions. The pathway to reducing disposal and associated GHG emissions will require significant expansion of the composting, anaerobic digestion, and recycling manufacturing infrastructure in the State.

To help reduce GHG emissions by 40 percent below 1990 levels by 2030 and meet California’s waste reduction goals, California’s waste management sector strives to achieve in-state processing and management of waste generated in California. To carry out this vision, we must work with residents and producers to reduce the volume of waste generated overall and capitalize on technology and social changes that might enable waste reduction. Packaging comprises approximately 8 million tons of waste landfilled in California annually, or about one quarter of the State’s total disposal stream. To reduce the climate change footprint of packaging, the State is promoting the inclusion of source reduction principles in packaging and product design; fostering recycling and recyclability as a front end design parameter for packaging and products that cannot be reduced; and encouraging recycling markets and market development for recycled-content products and packaging. CalRecycle is developing a packaging policy model containing components necessary for a mandatory comprehensive, statewide packaging program in California; this would need to be legislatively enacted to achieve a packaging reduction goal, such as 50 percent by 2030. CalRecycle is also continuing to work with stakeholder organizations and industry to explore complementary voluntary activities that have the potential to significantly decrease packaging disposal in California. In addition, large-scale shifts in materials management will be necessary, including steps to maximize recycling and diversion from landfills

218 CalRecycle. 2013. AB 341’s 75 Percent Goal and Potential New Recycling Jobs in California by 2020. July. www.calrecycle.ca.gov/Publications/Documents/1463/20131463.pdf

219 CARB approved a regulation to reduce methane from municipal solid waste landfills as a discrete early action measure under AB 32. The regulation became effective June 17, 2010. Additional information is available at: www.arb.ca.gov/regact/2009/landfills09/landfillfinalfro.pdf

and build the necessary infrastructure to support a sustainable, low carbon waste management system within California. Working together, State and local agencies will identify ways to increase the use of waste diversion alternatives and expand potential markets, obtain funds and incentives for building the infrastructure and strengthening markets, and evaluate the need for additional research to achieve California's GHG reduction and waste management goals.

Additional legislation codified since the First Scoping Plan Update outlines new opportunities and requirements to reduce GHG emissions from the waste sector, with a focus on reducing organic waste sent to landfills. SB 605 (Lara, Chapter 523, Statutes of 2014) requires that CARB develop a strategy to reduce SLCPs and SB 1383 requires the strategy to be implemented by January 1, 2018. CARB's recently adopted SLCP Reduction Strategy includes organic waste diversion targets for 2020 and 2025 consistent with SB 1383 to reduce methane emissions from landfills. It requires CalRecycle, in consultation with CARB, to adopt regulations to achieve statewide disposal targets to reduce landfilling of organic waste by: (1) 50 percent from the 2014 level by 2020, and (2) 75 percent from the 2014 level by 2025. Under SB 1383, of the edible food destined for the organic waste stream, not less than 20 percent is to be recovered to feed people in need by 2025. The regulations are to take effect on or after January 1, 2022, and CalRecycle, in consultation with CARB, must analyze the progress that the waste management sector, State government, and local government have made in achieving the 2020 and 2025 goals by July 1, 2020. It is estimated that the combined effect of the food waste prevention and rescue programs and organics diversion from landfills will reduce 4 MMTCO₂e of methane in 2030 (using a 20-year GWP), but one year of waste diversion in 2030 is expected to result in a reduction of 14 MMTCO₂e of emissions over the lifetime of waste decomposition.

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Goals

- Take full ownership of the waste generated in California.
- View waste as a resource and convert waste from all sectors to beneficial uses.
- Develop a sustainable, low carbon waste management system that processes collected waste within California and generates jobs, especially in disadvantaged communities.
- Maximize recycling and diversion from landfills.
- Reduce direct emissions from composting and digestion operations through improved technologies.
- Build the infrastructure needed to support a sustainable, low carbon waste management system within California.
- Increase organics markets which complement and support other sectors.²²⁰
- Capture edible food before it enters the waste stream and provide to people in need.
- Increase production of renewable transportation fuels from anaerobic digestion of waste.
- Recognize the co-benefits of compost application.

Cross-Sector Interactions

The waste management sector interacts with all of the other sectors of the State's economy. Reducing waste, including food waste, is key to reducing the State's overall carbon footprint. Additionally, replacing virgin materials with recycled materials reduces the energy and GHGs associated with the goods we produce and consume.

California leads the United States in agricultural production in terms of value and crop diversity. Soil carbon is the main source of energy for important soil microbes and is key for making nutrients available to plants. Waste-derived compost and other organic soil amendments support the State's Healthy Soils Initiative being implemented by CDFA. In addition, the use of compost to increase soil organic matter in the agricultural sector provides other benefits, including reduced GHG emissions, conserved water, reduced synthetic (petroleum-based) fertilizer and herbicide use, and sequestered carbon.

²²⁰ Examples may include renewable energy (biogas to renewable transportation fuels or electricity); soils (application of organics to agricultural soils for building soil organic matter and conserving water; application of organics to mulch for erosion control; application of organics to rangelands for increased carbon sequestration); and forests (support use of forest residues for erosion control; stabilization of fire-ravaged lands).

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit. In addition, to move forward with the goals of the waste management sector and achieve the 2030 target, certain actions are recommended to help set the groundwork. These actions affect several broad areas and are necessary for reducing the challenges facing this sector, and they are listed below as supporting actions.

Ongoing and Proposed Measures

- Continue implementation of the Landfill Methane Control Measure.
- Continue implementation of the Mandatory Commercial Recycling Regulation and the Mandatory Commercial Organics Recycling requirements.
- As required by SB 1383:
 - By 2018, CARB will implement the SLCP Strategy.
 - CalRecycle will develop regulations to require 50 percent organic waste diversion from landfills from 2014 levels by 2020 and 75 percent by 2025, including programs to achieve an edible food waste recovery goal of 20 percent below 2016 levels by 2025. The regulations shall take effect on or after January 1, 2022. By July 1, 2020, analyze the progress that the waste sector, State government, and local governments have made in achieving these goals.
 - CEC will develop recommendations for the development and use of renewable gas as part of the 2017 Integrated Energy Policy Report. Based on these recommendations, adopt policies and incentives to significantly increase sustainable production and use of renewable gas.

Potential Additional or Supporting Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

- Establishing a sustainable State funding source (such as an increased landfill tip fee and new generator charge) for development of waste management infrastructure, programs, and incentives.
- Working with residents and producers to reduce the volume of waste generated overall and capitalize on technology and social changes that might enable waste reduction.
- Increasing organics diversion from landfills, building on established mandates (AB 341's 75 percent by 2020 solid waste diversion goal, AB 1594,²²¹ AB 1826,²²² AB 876²²³) and new short-lived climate pollutant targets for 2025 (SB 605, SB 1383) to be accomplished via prevention (including food rescue), recycling, composting/digestion, and biomass options.
- Addressing challenges and issues associated with significant expansion and construction of organics and recycling infrastructure in California that is needed to achieve recycling and diversion goals. Challenges and issues include permitting, grid/pipeline connection, funding, local siting, markets, and research.
- Developing programmatic Environmental Impact Reports (EIRs) and model permit and guidance documents to assist in environmental review and CEQA for new facilities.
- Providing incentives for expanded and new facilities to handle organics and recyclables to meet 2020 and 2030 goals.
- Providing incentives to develop and expand food rescue programs to reduce the amount of edible food being sent to landfills.
- Further quantifying co-benefits of compost products and addressing regulatory barriers that do not provide for consideration of co-benefits.
- Supporting existing and new clean technologies and markets for excess woody biomass from urban areas, forests, and agriculture.
- Supporting the development of transportation fuel production at digestion facilities to generate renewable transportation fuels.

²²¹ Assembly Bill 1594, Waste Management (Williams, Chapter 719, Statutes of 2014).

²²² Assembly Bill 1826, Solid Waste: Organic Waste (Chesbro, Chapter 727, Statutes of 2014).

²²³ Assembly Bill 876, Compostable Organics (McCarty, Chapter 593, Statutes of 2015).

- Resolving issues of pipeline injection and grid connection to make renewable energy projects competitive.
- Supporting the use of available capacity at wastewater treatment plants that have digesters to process food waste.
- Working with local entities to provide a supportive framework to advance community-wide efforts that are consistent with, or exceed, statewide goals.
- Supporting research and development and pathways to market for dairy and codigestion digesters, including pipeline injection and interconnection.
- Supporting research on digestate characterization and end products.

Water

Water is essential to all life, and is vital to our overall health and well-being. A reliable, clean, and abundant supply of water is also a critical component of California's economy and has particularly important connections to energy, food, and the environment. California's water system includes a complex infrastructure that has been developed to support the capture, use, conveyance, storage, conservation, and treatment of water and wastewater. This elaborate network of storage and delivery systems enables the State to prosper and support populations, amidst wide variability in annual precipitation rates and concentration of rain north of Sacramento, through storing and moving water when and where it is needed.

Local water agencies play an important role in delivering water to communities, farms, and businesses. Some purchase water from the major State and federal projects, treat the water as needed, and deliver it to their customers; others act as wholesale agencies that buy or import water and sell it to retail water suppliers. Some agencies operate their own local water supply systems, including reservoirs and canals that store and move water as needed. Many agencies rely on groundwater exclusively, and operate local wells and distribution systems. In recent decades, local agencies have developed more diversified sources of water supplies. Many agencies use a combination of imported surface water and local groundwater, and also produce or purchase recycled water for end uses such as landscape irrigation.²²⁴

The State's developed surface and groundwater resources support a variety of residential, commercial, industrial, and agricultural activities. California's rapidly growing population—estimated to reach 44 million by 2030²²⁵—is putting mounting pressure on the water supply system. In the future, the ability to meet most new demand for water will come from a combination of increased conservation and water use efficiency, improved coordination of management of surface and groundwater, recycled water, new technologies in drinking water treatment, groundwater remediation, and brackish and seawater desalination.²²⁶

One of the State's largest uses of energy is attributed to several aspects of the water life cycle, including end uses such as heating and cooling, and water treatment and conveyance. Ten percent of the State's energy use is associated with water-related end uses, while water and wastewater systems account for 2 percent of the State's energy use.²²⁷ Therefore, as water demand grows, energy demand may increase concurrently. Population growth drives demand for both water and energy resources, so both grow at about the same rates and in many of the same geographic areas.²²⁸ This dynamic is further exacerbated by the precipitation-population mismatch between Northern and Southern California. Since the greatest energy consumption related to water is from delivery to end uses, the potential for energy savings also resides with water end users, where water conservation and efficiency play an important role.

The principal source of GHG emissions from the water sector comes from the fossil fuel-based energy consumed for water end uses (e.g., heating, cooling, pressurizing, and industrial processes), and the fossil fuel-based energy used to "produce" water (e.g., pump, convey, treat). Therefore, emissions reductions strategies are primarily associated with reducing the energy intensity of the water sector. Energy intensity is a measure of the amount of energy required to take a unit of water from its origin (such as a river or aquifer)

224 California Department of Water Resources. Regional Energy Intensity of Water Supplies. www.water.ca.gov/climatechange/RegionalEnergyIntensity.cfm

225 <http://www.dof.ca.gov/Forecasting/Demographics/projections/>

226 California Natural Resources Agency, California Department of Food and Agriculture, and California Environmental Protection Agency. California Water Action Plan.

227 California Department of Water Resources. Water-Energy Nexus: Statewide. Web page accessed November 2016 at: www.water.ca.gov/climatechange/WaterEnergyStatewide.cfm.

228 Ibid

and extract and convey it to its end use.²²⁹ Within California, the energy intensity of water varies greatly depending on the geography, water source, and end use. The California Department of Water Resources (DWR) subdivides the State into 10 regions corresponding to the State's major drainage basins. An interactive map on the DWR website allows users to see a summary of the energy intensity of regional water supplies, ignoring end-use factors.²³⁰ As the energy sector is decarbonized through measures such as increased renewable energy and improved efficiency, energy intensities will also be reduced. It is also important to note that end user actions to reduce water consumption or replace fresh water with recycled water do not automatically translate into GHG reductions. The integrated nature of the water supply system means that a reduction by one end user can be offset by an increase in consumption by another user. Likewise, use of recycled water has the potential to reduce GHGs if it replaces, and not merely serves as an alternative to, an existing, higher-carbon water supply.

The State is currently implementing several targeted, agricultural, urban, and industrial-based water conservation, recycling, and water use efficiency programs as part of an integrated water management effort that will help achieve GHG reductions through reduced energy demand within the water sector. Appendix H highlights the more significant existing policies, programs, measures, regulations, and initiatives that provide a framework for helping achieve GHG emissions reductions in this sector.

While it is important for every sector to contribute to the State's climate goals, ensuring universal access to clean water as outlined in AB 685 (Eng, Chapter 524, Statutes of 2012), also known as the "human right to water" bill, should take precedence over achieving GHG emissions reductions from water sector activities where a potential conflict exists. AB 685 states that it is the policy of the State that "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." As described in this section, water supplies vary in energy intensity and resulting GHGs, depending on the source of the water, treatment requirements, and location of the end user.

Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Goals

- Develop and support more reliable water supplies for people, agriculture, and the environment, provided by a more resilient, diversified, sustainably managed water resources system with a focus on actions that provide direct GHG reductions.
- Make conservation a California way of life by using and reusing water more efficiently through greater water conservation, drought tolerant landscaping, stormwater capture, water recycling, and reuse to help meet future water demands and adapt to climate change.
- Develop and support programs and projects that increase water sector energy efficiency and reduce GHG emissions through reduced water and energy use.
- Increase the use of renewable energy to pump, convey, treat, and utilize water.
- Reduce the carbon footprint of water systems and water uses for both surface and groundwater supplies through integrated strategies that reduce GHG emissions while meeting the needs of a growing population, improving public safety, fostering environmental stewardship, aiding in adaptation to climate change, and supporting a stable economy.

Cross-Sector Interactions

Water, energy, food, and ecosystems are inextricably linked, and meeting future climate challenges will require an integrated approach to managing the resources in these sectors.

Water is used in various applications in the energy sector, ranging in intensity from cooling of turbines and other equipment at power plants to cleaning solar photovoltaic panels. In 2003, CEC adopted a water conservation policy for power plants to limit the use of freshwater for power plant cooling, and has since encouraged project

229 A broader definition of energy intensity could consider the "downstream" energy (i.e., wastewater treatment) as well as the upstream components. More robust data are needed, and the State is working to better quantify these upstream and downstream emissions.

230 California Department of Water Resources. Regional Energy Intensity of Water Supplies.
www.water.ca.gov/climatechange/RegionalEnergyIntensity.cfm

owners proposing to build new power plants in California to reduce water consumption with water-efficiency technologies such as dry cooling and to conserve fresh water by using recycled water. Likewise, energy is used in multiple ways and at multiple steps in water delivery and treatment systems, including energy for heating and chilling water; treating and delivering drinking water; conveying water; extracting groundwater; desalination; pressurizing water for irrigation; and wastewater collection, treatment, and disposal.

Although GHG reduction strategies for the water sector have the closest ties to energy, the water sector also interacts with the natural and working lands, agricultural, waste management, and transportation sectors. Water flows from mountains to downstream regions through natural and working lands, which provide habitat for many species and function to store water, recharge groundwater, naturally purify water, and moderate flooding. Protection of key lands from conversion results in healthier watersheds by reducing polluted runoff and maintaining a properly functioning ecosystem. California is the United States' leading agricultural production state in terms of value and crop diversity. Approximately nine million acres of farmland in California are irrigated.²³¹ In addition, water use is associated with livestock watering, feedlots, dairy operations, and other on-farm needs. Altogether, agriculture uses about 40 percent of the State's managed water supply.²³² In the end, agricultural products produced in California are consumed by humans throughout the world as food, fiber, and fuel. Wastewater treatment plants provide a complementary opportunity for the waste management sector to help process organic waste diversion from landfills. Treatment plants with spare capacity can potentially accommodate organic waste for anaerobic co-digestion of materials such as food waste and fats, oil, and grease from residential, commercial, or industrial facilities to create useful by-products such as electricity, hydrogen, biofuels, and soil amendments.²³³ The water sector is also essential to our community health and long-term well-being, and measures must ensure that we continue to have access to clean and reliable sources of drinking water. Climate change threatens to impact our water supplies, for example, with long-term droughts leading to wells and other sources of water running dry. This can have devastating consequences, especially on communities already vulnerable and sensitive to changes in their water supply and natural hydrological systems, including rural communities who have limited options for water supplies. Water conservation and management strategies that are energy efficient can also ensure a continued supply of water for our health and well-being.

Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit. In addition, several recommended actions are identified to help the water sector move forward with the identified goals and measures to achieve the 2030 target; these are listed as supporting actions.

Ongoing and Proposed Measures

- As directed by Governor Brown's Executive Order B-37-16, DWR and State Water Resources Control Board (SWRCB) will develop and implement new water use targets to generate more statewide water conservation than existing targets (the existing State law requires a 20 percent reduction in urban per capita water use by 2020 [SBx7-7, Steinberg, Chapter 4, Statutes of 2009]). The new water use targets will be based on strengthened standards for indoor use, outdoor irrigation, commercial, industrial, and institutional water use.
- SWRCB will develop long-term water conservation regulation, and permanently prohibit practices that waste potable water.
- DWR and SWRCB will develop and implement actions to minimize water system leaks, and to set performance standards for water loss, as required by SB 555 (Wolk, Chapter 679, Statutes of 2015).
- DWR and CDFA will update existing requirements for agricultural water management plans to increase water system efficiency.

231 Hanson, Blaine. No date. Irrigation of Agricultural Crops in California. PowerPoint. Department of Land, Air and Water Resources University of California, Davis. www.arb.ca.gov/fuels/lcfs/workgroups/lcfsustain/hanson.pdf

232 Applied water use is the official terminology used by DWR. "Applied water refers to the total amount of water that is diverted from any source to meet the demands of water users without adjusting for water that is used up, returned to the developed supply, or considered irrecoverable."

233 An example of a resource recovering project that can help achieve methane reductions includes fuel cells that are integrated into wastewater treatment plants for both onsite heat and power generation and the production of renewable hydrogen.

- CEC will certify innovative technologies for water conservation and water loss detection and control.
- CEC will continue to update the State's Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601–1608) for appliances offered for sale in California to establish standards that reduce energy consumption for devices that use electricity, gas, and/or water.
- California Environmental Protection Agency (CalEPA) will oversee development of a voluntary registry for GHG emissions resulting from the water-energy nexus, as required by SB 1425 (Pavley, Chapter 596, Statutes of 2016).
- The State Water Project has entered long-term contracts to procure renewable electricity from 140 MW solar installations in California.
- As described in its Climate Action Plan, DWR will continue to increase the use of renewable energy to operate the State Water Project.

Overall, these actions will contribute to the broader energy efficiency goals discussed in the Low Carbon Energy section of this chapter.

Potential Additional or Supporting Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter 2. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

- Where technically feasible and cost-effective, local water and wastewater utilities should adopt a long-term goal to reduce GHGs by 80 percent below 1990 levels by 2050 (consistent with DWR's Climate Action Plan), and thereafter move toward low carbon or net-zero carbon water management systems.
- Local water and wastewater utilities should develop distributed renewable energy where feasible, using the expanded Local Government Renewable Energy Bill Credit (RES-BCT) tariff and new Net Energy Metering (which allow for installation without system size limit).
- In support of the Short-Lived Climate Pollutant Strategy, encourage resource recovering wastewater treatment projects to help achieve the goal of reducing fugitive methane by 40 percent by 2030, to include:
 - Determining opportunities to support co-digestion of food-related waste streams at wastewater treatment plants.
 - Incentivizing methane capture systems at wastewater treatment plants to produce renewable electricity, transportation fuel, or pipeline biomethane.
- Support compact development and land use patterns, and associated conservation and management strategies for natural and working lands that reduce per capita water consumption through more water-efficient built environments.

Chapter 5

ACHIEVING SUCCESS

Meeting, and exceeding, our mandated GHG reduction goals in 2020 and through 2030 requires building on California’s decade of success in implementing effective climate policies. State agencies are increasingly coordinating planning activities to align with overarching climate, clean air, social equity, and broader economic objectives.

However, to definitely tip the scales in favor of rapidly declining emissions, we also need to reach beyond State policy-making and engage all Californians. Further progress can be made by supporting innovative actions at the local level—among governments, small businesses, schools, and individual households. Ultimately, success depends on a mix of regulatory program development, incentives, institutional support, and education and outreach to ensure that clean energy and other climate strategies are clear, winning alternatives in the marketplace—to drive business development and consumer adoption.

Ongoing Engagement with Environmental Justice Communities

CARB continues seek ways to improve implementation of AB 32 and the unique set of impacts facing environmental justice communities. However, CARB’s environmental justice efforts reach far beyond climate change. In 2001, the Board approved CARB’s “Policies and Actions for Environmental Action,”²³⁴ which expresses a broad commitment to environmental justice and makes it integral to all of CARB’s programs, consistent with State directives at the time. Though over the years CARB has taken on a wide array of activities aimed at reducing environmental burdens on environmental justice communities, it has not knitted its various efforts together in a coherent narrative or maximized the impact of these activities by leveraging them off of each other.

This year, CARB appointed its first executive-level environmental justice liaison. Under her leadership, CARB will lay a roadmap for better serving California’s environmental justice communities in the design and implementation of its programs, and identifying new actions CARB can take to advance environmental justice and social equity in all of its functions.

The extensive legislative framework addressing climate change, air quality, and environmental justice that has emerged since the passage of AB 32 has prompted CARB to step up its environmental justice efforts and articulate a vision that reflects the current context. CARB will initiate a public process, seeking advice and input from environmental justice advocates and other key stakeholders to inform the development of a new strategic plan for further institutionalizing environmental justice and social equity.

CARB understands that in addition to our programs to address climate change and reduce emissions of GHGs, more needs to be done to reduce exposure to toxic air and criteria pollutants and improve the quality of life in communities surrounding our largest emissions sources. To this end, and consistent with AB 617, AB 197, AB 1071, SB 535 and AB 1550, we will actively engage EJ advocates, communities, and relevant air districts in the development of programs that improve air quality and quantify the burdens placed on air quality in local communities. Measuring and monitoring air quality conditions over time and ongoing community engagement are integral to the success of CARB’s efforts. This engagement will include substantive discussions with EJ stakeholders, gathering their input and providing adequate time for review before matters are taken to the Board for decision.

²³⁴ www.arb.ca.gov/ch/programs/ej/ejpolicies.pdf

CARB's approach to environmental justice will be grounded in five primary pillars: transparency, integration, monitoring, research, and enforcement.

- **Transparency:** CARB must improve communication and engagement with environmental justice stakeholders and deepen partnerships with local communities impacted by air pollution. CARB will continue to prioritize transparency in its decision-making processes and provide better access to the air quality, toxics, and GHG data CARB collects and stewards.
- **Integration:** Besides integrating environmental justice throughout all of CARB's programs, those programs must complement each other. To that end, CARB will endeavor to break down programmatic silos so that it is able to leverage its work and achieve more effective and timely results. Focused resources in individual communities can accelerate reduction in emissions, proliferation of clean vehicles and creation of jobs in the clean energy economy, while concurrently improving public health.
- **Monitoring:** Communities should be engaged in CARB's monitoring work. They can play a critical role in collecting their own data and adding to the coverage of other air monitoring efforts (e.g., CARB, local air districts). CARB has already invested in research on low-cost monitors that are accessible by communities, and it will continue to evaluate how community monitoring can make CARB more nimble in identifying and addressing "hotspots." Mobile monitoring projects similarly will allow CARB to better serve and protect residents of disadvantaged communities. CARB will continue to build partnerships with local communities and help build local capacity through funding and technical assistance.
- **Research:** CARB's research agenda is core to achieving its mission. To ensure that the research done by CARB responds to environmental justice concerns and has the greatest potential to improve air quality and public health in disadvantaged communities, CARB will engage communities groups early in the development of its research agenda and the projects that flow out from that agenda.
- **Enforcement:** Disadvantaged communities are often impacted by many sources of pollution. In order to improve air quality and protect public health, CARB will prioritize compliance with legal requirements, including enforcement actions if necessary, in environmental justice communities to ensure emissions of toxic and criteria pollutants in these communities are as low as possible.

Our inclusive approaches to further environmental justice in California's local communities may include an array of direct regulation, funding, and community capacity-building. CARB will continue to actively implement the provisions of AB 617, AB 197, AB 1071, SB 535, AB 1550, and other laws to better ensure that environmental justice communities see additional benefits from our clean air and climate policies. Our inclusive approaches to further environmental justice in California's local communities may include an array of direct regulation, funding, and community capacity-building.

Enabling Local Action

Local governments are essential partners in achieving California's goals to reduce GHG emissions. Local governments can implement GHG emissions reduction strategies to address local conditions and issues and can effectively engage citizens at the local level. Local governments also have broad jurisdiction, and sometimes unique authorities, through their community-scale planning and permitting processes, discretionary actions, local codes and ordinances, outreach and education efforts, and municipal operations. Further, local jurisdictions can develop new and innovative approaches to reduce GHG emissions that can then be adopted elsewhere. For example, local governments can develop land use plans with more efficient development patterns that bring people and destinations closer together in more mixed-use, compact communities that facilitate walking, biking, and use of transit. Local governments can also incentivize locally generated renewable energy and infrastructure for alternative fuels and electric vehicles, implement water efficiency measures, and develop waste-to-energy and waste-to-fuel projects. These local actions complement statewide measures and are critical to supporting the State's efforts to reduce emissions. Local efforts can deliver substantial additional GHG and criteria emissions reductions beyond what State policy can alone, and these efforts will sometimes be more cost-effective and provide more cobenefits than relying exclusively on top-down statewide regulations to achieve the State's climate stabilization goals. To ensure local and regional engagement, it is also recommended local jurisdictions make readily available information regarding ongoing and proposed actions to reduce GHGs within their region.

Many cities and counties are already setting GHG reduction targets, developing local plans, and making progress toward reducing emissions. The Statewide Energy Efficiency Collaborative recently released a report, *The State of Local Climate Action: California 2016*,²³⁵ which highlights local government efforts, including:

- In California, 60 percent of cities and over 70 percent of counties have completed a GHG inventory, and 42 percent of local governments have completed a climate, energy, or sustainability plan that directly addresses GHG emissions. Many other community-scale local plans, such as general plans, have emissions reduction measures incorporated as well (see Governor's Office of Planning and Research [OPR] Survey questions 23 and 24).²³⁶
- Over one hundred California local governments have developed emissions reduction targets that, if achieved, would result in annual reductions that total 45 MMTCO₂e by 2020 and 83 MMTCO₂e by 2050.²³⁷

Local air quality management and air pollution control districts also play a key role in reducing regional and local sources of GHG emissions by actively integrating climate protection into air quality programs. Air districts also support local climate protection programs by providing technical assistance and data, quantification tools, and even funding.²³⁸ Local metropolitan planning organizations (MPOs) also support the State's climate action goals via sustainable communities strategies (SCSs), required by the Sustainable Communities and Climate Protection Act of 2008 (SB 375, Chapter 728, Statutes of 2008). Under SB 375, MPOs must prepare SCSs as part of their regional transportation plan to meet regional GHG reduction targets set by CARB for passenger vehicles in 2020 and 2035. The SCSs contain land use, housing, and transportation strategies that allow regions to meet their GHG emissions reductions targets.



To engage communities in efforts to reduce GHG emissions, CARB has partnered with Energy Upgrade California on the CoolCalifornia Challenge. It is a competition among California cities to reduce their carbon footprints and build more vibrant and sustainable communities. Three challenges have been completed. Most recently, the 2015–2016 Challenge included 22 cities and engaged nearly 3,200 households, each of which took actions to reduce energy use and carbon GHG emissions. In total, the participants reported savings of 5,638 MTCO₂ from completed actions, equivalent to emissions from more than 1,000 cars or from electricity used by more than 2,500 California homes in a year.

State agencies support these local government actions in several ways:

- CoolCalifornia.org is an informational website that provides resources that assist local governments, small businesses, schools, and households to reduce GHG emissions. The local government webpage includes carbon calculators, a climate planning resource guide, a Funding Wizard that outlines grant and loan programs, and success stories. It also features ClearPath California, a no-cost GHG inventory, climate action plan development, and tracking tool developed through the Statewide Energy Efficiency Collaborative in coordination with CARB and the Governor's Office of Planning and Research (OPR).
- Chapter 8 of OPR's General Plan Guidelines²³⁹ provides guidance for climate action plans and

²³⁵ Statewide Energy Efficiency Collaborative. 2016. State of Local Climate Action: California 2016.

californiaseec.org/wp-content/uploads/2016/10/State-of-Local-Climate-Action-California-2016_Screen.pdf

²³⁶ Governor's Office of Planning and Research. 2016. 2016 Annual Planning Survey Results. November.

www.opr.ca.gov/docs/2016_APS_final.pdf

²³⁷ These reductions include reductions from both state and local measures.

²³⁸ Examples include: (1) Bay Area Air Quality Management District (BAAQMD). 2016 Clean Air Plan and Regional Climate Protection Strategy. Available at: www.baaqmd.gov/plans-and-climate/air-quality-plans/plans-under-development; (2) California Air Pollution Control Officers Association. California Emissions Estimator Model (CalEEMod). Available at: www.caleemod.com/; (3) San Joaquin Valley Air Pollution Control District. Grants and Incentives. Available at: valleyair.org/grants/; (4) BAAQMD. Grant Funding. Available at: www.baaqmd.gov/grant-funding; (5) South Coast Air Quality Management District. Funding. Available at: www.aqmd.gov/grants-bids/funding; (6) Sacramento Metropolitan Air Quality Management District. Incentive Programs. Available at: www.airquality.org/Residents/Incentive-Programs.

²³⁹ <http://opr.ca.gov/planning/general-plan/>

other plans linked to general plans, which address the community scale approach outlined in CEQA Guidelines Section 15183.5(b), Plans for the Reduction of Greenhouse Gas Emissions.

- OPR hosts the Integrated Climate Adaptation and Resiliency Program, which is developing resources and case studies that outline the co-benefits of implementing emissions reduction strategies and addressing the impacts of climate change.
- CARB is developing a centralized database and interactive map that will display the current statewide status of local government climate action planning. Users can view and compare the details of emission inventories, planned GHG reduction targets and strategies, and other climate action details specific to each local government. This information will help jurisdictions around California identify what climate action strategies are working in other, similar jurisdictions across the State, and will facilitate collaboration among local governments pursuing GHG reduction strategies and goals. This database and map will be featured on the CoolCalifornia.org website and are anticipated to be available in 2017.
- Additional information on local government activities is available on Cal-Adapt (www.cal-adapt.org) and OPR (www.opr.ca.gov)

Further, a significant portion of the \$3.4 billion in cap-and-trade expenditures has either directly or indirectly supported local government efforts to reduce emissions, including, for example, the Affordable Housing and Sustainable Communities (AHSC) program and approximately \$142 million for project implementation and planning grants awarded under the Transformative Climate Communities program.

Climate Action through Local Planning and Permitting

Local government efforts to reduce emissions within their jurisdiction are critical to achieving the State's long-term GHG goals, and can also provide important co-benefits, such as improved air quality, local economic benefits, more sustainable communities, and an improved quality of life. To support local governments in their efforts to reduce GHG emissions, the following guidance is provided. This guidance should be used in coordination with OPR's General Plan Guidelines guidance in Chapter 8, Climate Change.²⁴⁰ While this guidance is provided out of the recognition that local policy makers are critical in reducing the carbon footprint of cities and counties, the decision to follow this guidance is voluntary and should not be interpreted as a directive or mandate to local governments.

Recommended Local Plan-Level Greenhouse Gas Emissions Reduction Goals

CARB recommends statewide targets of no more than six metric tons CO₂e per capita by 2030 and no more than two metric tons CO₂e per capita by 2050.²⁴¹ The statewide per capita targets account for all emissions sectors in the State, statewide population forecasts, and the statewide reductions necessary to achieve the 2030 statewide target under SB 32 and the longer term State emissions reduction goal of 80 percent below 1990 levels by 2050.²⁴² The statewide per capita targets are also consistent with Executive Order S-3-05, B-30-15, and the Under 2 MOU that California originated with Baden-Württemberg and has now been signed or endorsed by 188 jurisdictions representing 39 countries and six continents.^{243,244} Central to the Under 2 MOU is that all signatories agree to reduce their GHG emissions to two metric tons CO₂e per capita by 2050. This limit represents California's and these other governments' recognition of their "fair share" to reduce GHG emissions to the scientifically based levels to limit global warming below two degrees Celsius. This limit is also consistent with the Paris Agreement, which sets out a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to below 2°C.²⁴⁵

CARB recommends that local governments evaluate and adopt robust and quantitative locally-appropriate

240 <http://opr.ca.gov/planning/general-plan/>.

241 These goals are appropriate for the plan level (city, county, subregional, or regional level, as appropriate), but not for specific individual projects because they include all emissions sectors in the State.

242 This number represents the 2030 and 2050 targets divided by total population projections from California Department of Finance.

243 <http://under2mou.org/> California signed the Under 2 MOU on May 19, 2015. See under2mou.org/wp-content/uploads/2015/05/California-appendix-English.pdf and under2mou.org/wp-content/uploads/2015/05/California-Signature-Page.pdf.

244 The Under 2 MOU signatories include jurisdictions ranging from cities to countries to multiple-country partnerships. Therefore, like the goals set forth above for local and regional climate planning, the Under 2 MOU is scalable to various types of jurisdictions.

245 UNFCCC. The Paris Agreement. unfccc.int/paris_agreement/items/9485.php

goals that align with the statewide per capita targets and the State's sustainable development objectives and develop plans to achieve the local goals. The statewide per capita goals were developed by applying the percent reductions necessary to reach the 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to the State's 1990 emissions limit established under AB 32.

Numerous local governments in California have already adopted GHG emissions reduction goals for year 2020 consistent with AB 32. CARB advises that local governments also develop community-wide GHG emissions reduction goals necessary to reach 2030 and 2050 climate goals. Emissions inventories and reduction goals should be expressed in mass emissions, per capita emissions, and service population emissions. To do this, local governments can start by developing a community-wide GHG emissions target consistent with the accepted protocols as outlined in OPR's General Plan Guidelines Chapter 8: Climate Change. They can then calculate GHG emissions thresholds by applying the percent reductions necessary to reach 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to their community-wide GHG emissions target. Since the statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the State, it is appropriate for local jurisdictions to derive evidence-based local per capita²⁴⁶ goals based on local emissions sectors and population projections that are consistent with the framework used to develop the statewide per capita targets. The resulting GHG emissions trajectory should show a downward trend consistent with the statewide objectives. The recommendation for a community-wide goal expands upon the reduction of 15 percent from "current" (2005-2008) levels by 2020 as recommended in the 2008 Scoping Plan.²⁴⁷

In developing local plans, local governments should refer to "The U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions,"²⁴⁸ (community protocol) which provides detailed guidance on completing a GHG emissions inventory at the community scale in the United States – including emissions from businesses, residents, and transportation. Quantification tools such as ClearPath California, which was developed with California agencies, also support the analysis of community-scale GHG emissions. Per the community protocol, these plans should disclose all emissions within the defined geographical boundary, even those over which the local government has no regulatory authority to control, and then focus the strategies on those emissions that the jurisdiction controls. For emissions from transportation, the community protocol recommends including emissions from trips that extend beyond the community's boundaries. Local plans should also include the carbon sequestration values associated with natural and working lands, and the importance of jurisdictional lands for water, habitat, agricultural, and recreational resources. Strategies developed to achieve the local goals should prioritize mandatory measures that support the Governor's "Five Pillars" and other key state climate action goals.²⁴⁹ Examples of plan-level GHG reduction actions that could be implemented by local governments are listed in Appendix B. Additional information and tools on how to develop GHG emissions inventories and reduction plans tied to general plans can be found in OPR's General Plan Guidelines and at CoolCalifornia.org.

These local government recommendations are based on the recognition that California must accommodate population and economic growth in a far more sustainable manner than in the past. While state-level investments, policies, and actions play an important role in shaping growth and development patterns, regional and local governments and agencies are uniquely positioned to influence the future of the built environment and its associated GHG emissions. Greenhouse gas emissions reduction strategies in Climate Action Plans (CAPs) and other local plans can also lead to important co-benefits, such as improved air quality, local economic benefits such as green jobs, more mobility choices, improved public health and quality of life, protection of locally, statewide, and globally important natural resources, and more equitable sharing of these benefits across communities.

Contributions from policies and programs, such as renewable energy and energy efficiency, are helping to achieve the near-term 2020 target, but longer-term targets cannot be achieved without land use decisions that allow more efficient use and management of land and infrastructure. Local governments have primary authority to plan, zone, approve, and permit how and where land is developed to accommodate population growth, economic growth, and the changing needs of their jurisdictions. Land use decisions affect GHG emissions associated with transportation, water use, wastewater treatment, waste generation and treatment, energy consumption, and conversion of natural and working lands. Local land use decisions play a particularly

246 Or some other metric that the local jurisdiction deems appropriate (e.g., mass emissions, per service population)

247 2008 Scoping Plan, page 27, www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

248 <http://iclei.usa.org/publications/us-community-protocol/>

249 www.arb.ca.gov/cc/pillars/pillars.htm

critical role in reducing GHG emissions associated with the transportation sector, both at the project level, and in long-term plans, including general plans, local and regional climate action plans, specific plans, transportation plans, and supporting sustainable community strategies developed under SB 375.

While the State can do more to accelerate and incentivize these local decisions, local actions that reduce VMT are also necessary to meet transportation sector-specific goals and achieve the 2030 target under SB 32. Through developing the Scoping Plan, CARB staff is more convinced than ever that, in addition to achieving GHG reductions from cleaner fuels and vehicles, California must also reduce VMT. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward needed reductions, but alone will not provide the VMT growth reductions needed; there is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals. In its evaluation of the role of the transportation system in meeting the statewide emissions targets, CARB determined that VMT reductions of 7 percent below projected VMT levels in 2030 (which includes currently adopted SB 375 SCSs) are necessary. In 2050, reductions of 15 percent below projected VMT levels are needed. A 7 percent VMT reduction translates to a reduction, on average, of 1.5 miles/person/day from projected levels in 2030. It is recommended that local governments consider policies to reduce VMT to help achieve these reductions, including: land use and community design that reduces VMT; transit oriented development; street design policies that prioritize transit, biking, and walking; and increasing low carbon mobility choices, including improved access to viable and affordable public transportation and active transportation opportunities. It is important that VMT reducing strategies are implemented early because more time is necessary to achieve the full climate, health, social, equity, and economic benefits from these strategies.

Once adopted, the plans and policies designed to achieve a locally-set GHG goal can serve as a performance metric for later projects. Sufficiently detailed and adequately supported GHG reduction plans (including CAPs) also provide local governments with a valuable tool for streamlining project-level environmental review. Under CEQA, individual projects that comply with the strategies and actions within an adequate local CAP can streamline the project-specific GHG analysis.²⁵⁰ The California Supreme Court recently called out this provision in CEQA as allowing tiering from a geographically specific GHG reduction plan.²⁵¹ The Court also recognized that GHG determinations in CEQA should be consistent with the statewide Scoping Plan goals, and that CEQA documents taking a goal-consistency approach may soon need to consider a project's effects on meeting the State's longer term post-2020 goals.²⁵² The recommendation above that local governments develop local goals tied to the statewide per capita goals of six metric tons CO₂e by 2030 and no more than two metric tons CO₂e per capita by 2050 provides guidance on CARB's view on what would be consistent with the 2017 Scoping Plan and the State's long-term goals.

Production based inventories and emissions reduction programs are appropriate for local communities wanting to mitigate their emissions pursuant to CEQA Section 15183.5(b). Consumption based inventories are complementary to production based inventories and are appropriate as a background setting, disclosure, and as an outreach tool to show how personal decisions may change a person's or household's contribution to climate change. For additional information, see the OPR General Plan Guidelines.²⁵³

Project-Level Greenhouse Gas Emissions Reduction Actions and Thresholds

Beyond plan-level goals and actions, local governments can also support climate action when considering discretionary approvals and entitlements of individual projects through CEQA. Absent conformity with an adequate geographically-specific GHG reduction plan as described in the preceding section above, CARB recommends that projects incorporate design features and GHG reduction measures, to the degree feasible, to minimize GHG emissions. Achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development. There are recent examples of land use development projects in California that have demonstrated that it is feasible to design projects that achieve zero net additional GHG emissions. Several projects have received certification from the Governor under AB 900, the Jobs and Economic Improvement through Environmental Leadership Act (Buchanan, Chapter 354, Statutes of 2011), demonstrating an ability to design economically viable projects that create jobs while contributing no net additional GHG emissions.²⁵⁴ Another example is the Newhall

250 CEQA Guidelines, § 15183.5, sub. (b).

251 Center for Biological Diversity v. California Dept. of Fish and Wildlife (2015) 62 Cal.4th 204, 229–230.

252 Id. at pp. 223–224.

253 <http://opr.ca.gov/planning/general-plan/>.

254 Governor's Office of Planning and Research. California Jobs. <http://www.opr.ca.gov/ceqa/california-jobs.html>

Ranch Resource Management and Development Plan and Spineflower Conservation Plan,²⁵⁵ in which the applicant, Newhall Land and Farming Company, proposed a commitment to achieve net zero GHG emissions for a very large-scale residential and commercial specific planned development in Santa Clarita Valley.

Achieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA. Lead agencies have the discretion to develop evidence-based numeric thresholds (mass emissions, per capita, or per service population) consistent with this Scoping Plan, the State's long-term GHG goals, and climate change science.²⁵⁶

To the degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from VMT, and direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits locally. For example, on-site design features to be considered at the planning stage include land use and community design options that reduce VMT, promote transit oriented development, promote street design policies that prioritize transit, biking, and walking, and increase low carbon mobility choices, including improved access to viable and affordable public transportation, and active transportation opportunities. Regionally, additional GHG reductions can be achieved through direct investment in local building retrofit programs that can pay for cool roofs, solar panels, solar water heaters, smart meters, energy efficient lighting, energy efficient appliances, energy efficient windows, insulation, and water conservation measures for homes within the geographic area of the project. These investments generate real demand side benefits and local jobs, while creating the market signals for energy efficient products, some of which are produced in California. Other examples of local direct investments include financing installation of regional electric vehicle (EV) charging stations, paying for electrification of public school buses, and investing in local urban forests.

Local direct investments in actions to reduce GHG emissions should be supported by quantification methodologies that show the reductions are real, verifiable, quantifiable, permanent, and enforceable. Where further project design or regional investments are infeasible or not proven to be effective, it may be appropriate and feasible to mitigate project emissions through purchasing and retiring carbon credits. CAPCOA has developed the GHG Reduction Exchange (GHG Rx) for CEQA mitigation, which could provide credits to achieve additional reductions. It may also be appropriate to utilize credits issued by a recognized and reputable voluntary carbon registry. Appendix B includes examples of on-site project design features, mitigation measures, and direct regional investments that may be feasible to minimize GHG emissions from land use development projects.

California's future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use.²⁵⁷ GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches.²⁵⁸ Further, the State's understanding of transportation impacts continues to evolve. The CEQA Guidelines are being updated to focus the analysis of transportation impacts on VMT. OPR's Technical Advisory includes methods of analysis of transportation impacts, approaches to setting significance thresholds, and includes examples of VMT mitigation under CEQA.²⁵⁹

255 <https://nrm.dfg.ca.gov/documents/ContextDocs.aspx?cat=NewhallRanchFinal>

256 CARB provided some guidance on development project thresholds in a paper issued in October 2008, which included a concept utilizing a bright-line mass numeric threshold based on capturing approximately 90 percent of emissions in that sector and a concept of minimum performance based standards. Some districts built upon that work to develop thresholds. For example, Santa Barbara County adopted a bright-line numeric threshold of 1,000 MTCO₂e/yr for industrial stationary-source projects, and Sacramento Metropolitan Air Quality Management District adopted a 10,000 MTCO₂e/yr threshold for stationary source projects and a 1,100 MTCO₂e/yr threshold for construction activities and land development projects in their operational phase. CARB is not endorsing any one of these approaches, but noting them for informational purposes.

257 Robert Cervero, Jim Murakami; Effects of Built Environment on Vehicle Miles Traveled: Evidence from 370 US Urbanized Areas. *Environment and Planning A*, Vol 42, Issue 2, pp. 400-418, February-01-2010; Ewing, R., & Rong, F. (2008). The impact of urban form on U.S. residential energy use. *Housing Policy Debate*, 19 (1), 1-30.).

258 CAPCOA, *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*, August, 2010.

259 <http://www.opr.ca.gov/ceqa/updates/sb-743/>

Implementing the Scoping Plan

This Scoping Plan outlines the regulations, programs, and other mechanisms needed to reduce GHG emissions in California. CARB and other State agencies will work closely with State and local agencies, stakeholders, Tribes, and the public to develop regulatory measures and other programs to implement the Scoping Plan. CARB and other State agencies will develop regulations in accordance with established rulemaking guidelines. Per Executive Order B-30-15, as these regulatory measures and other programs are developed, building programs for climate resiliency must also be a consideration. Additionally, agencies will further collaborate and work to provide the institutional support needed to overcome barriers that may currently hinder certain efforts to reduce GHG emissions and to support the goals, actions, and measures identified for key sectors in Chapter 4. Table 17 provides a high-level summary of the Climate Change Policies and Measures discussed in the Scoping Plan, including, but not limited to, those identified specifically to achieve the 2030 target.

TABLE 17: CLIMATE CHANGE POLICIES AND MEASURES

Recommended Action	Lead Agency
<p>Implement SB 350 by 2030:</p> <ul style="list-style-type: none"> • Increase the Renewables Portfolio Standard to 50 percent of retail sales by 2030 and ensure grid reliability. • Establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030. • Reduce GHG emissions in the electricity sector through the implementation of the above measures and other actions as modeled in IRPs to meet GHG emissions reductions planning targets in the IRP process. Load-serving entities and publicly-owned utilities meet GHG emissions reductions planning targets through a combination of measures as described in IRPs. 	CPUC, CEC, CARB
<p>Implement Mobile Source Strategy (Cleaner Technology and Fuels):</p> <ul style="list-style-type: none"> • At least 1.5 million zero emission and plug-in hybrid light-duty electric vehicles by 2025. • At least 4.2 million zero emission and plug-in hybrid light-duty electric vehicles by 2030. • Further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean Cars regulations. • Medium- and heavy-duty GHG Phase 2. • Innovative Clean Transit: Transition to a suite of to-be-determined innovative clean transit options. Assumed 20 percent of new urban buses purchased beginning in 2018 will be zero emission buses with the penetration of zero-emission technology ramped up to 100 percent of new sales in 2030. Also, new natural gas buses, starting in 2018, and diesel buses, starting in 2020, meet the optional heavy-duty low-NO_x standard. • Last Mile Delivery: New regulation that would result in the use of low NO_x or cleaner engines and the deployment of increasing numbers of zero-emission trucks primarily for class 3-7 last mile delivery trucks in California. This measure assumes ZEVs comprise 2.5 percent of new Class 3–7 truck sales in local fleets starting in 2020, increasing to 10 percent in 2025 and remaining flat through 2030. • Further reduce VMT through continued implementation of SB 375 and regional Sustainable Communities Strategies; forthcoming statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy but included in the document “Potential VMT Reduction Strategies for Discussion.” 	CARB, CalSTA, SGC, CalTrans CEC, OPR, Local agencies
Increase stringency of SB 375 Sustainable Communities Strategy (2035 targets).	CARB
<p>By 2019, adjust performance measures used to select and design transportation facilities.</p> <ul style="list-style-type: none"> • Harmonize project performance with emissions reductions, and increase competitiveness of transit and active transportation modes (e.g. via guideline documents, funding programs, project selection, etc.). 	CalSTA and SGC, OPR, CARB, GoBiz, IBank, DOF, CTC, Caltrans
By 2019, develop pricing policies to support low-GHG transportation (e.g. low-emission vehicle zones for heavy duty, road user, parking pricing, transit discounts).	CalSTA, Caltrans, CTC, OPR/SGC, CARB

Recommended Action	Lead Agency
Implement California Sustainable Freight Action Plan: <ul style="list-style-type: none"> Improve freight system efficiency. Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize both zero and near-zero emission freight vehicles and equipment powered by renewable energy by 2030. 	CalSTA, CalEPA, CNRA, CARB, CalTrans, CEC, GoBiz
Adopt a Low Carbon Fuel Standard with a CI reduction of 18 percent.	CARB
Implement the Short-Lived Climate Pollutant Strategy by 2030: <ul style="list-style-type: none"> 40 percent reduction in methane and hydrofluorocarbon emissions below 2013 levels. 50 percent reduction in black carbon emissions below 2013 levels. 	CARB, CalRecycle, CDFA, SWRCB, Local air districts
By 2019, develop regulations and programs to support organic waste landfill reduction goals in the SLCP and SB 1383.	CARB, CalRecycle, CDFA, SWRCB, Local air districts
Implement the post-2020 Cap-and-Trade Program with declining annual caps.	CARB
By 2018, develop Integrated Natural and Working Lands Implementation Plan to secure California's land base as a net carbon sink: <ul style="list-style-type: none"> Protect land from conversion through conservation easements and other incentives. Increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity Utilize wood and agricultural products to increase the amount of carbon stored in the natural and built environments Establish scenario projections to serve as the foundation for the Implementation Plan 	CNRA and departments within, CDFA, CalEPA, CARB
Establish a carbon accounting framework for natural and working lands as described in SB 859 by 2018	CARB
Implement Forest Carbon Plan	CNRA, CAL FIRE, CalEPA and departments within
Identify and expand funding and financing mechanisms to support GHG reductions across all sectors.	State Agencies & Local Agencies

A Comprehensive Approach to Support Climate Action

Ultimately, successfully tipping the scales in the fight against climate change relies on our ability to incentivize clean technologies in the marketplace and to make other climate strategies clearly understood and easily accessible. We must support and guide our businesses as they continue to innovate and make clean technologies ever more attractive to ever more savvy consumers. Until the point that clean technologies become the best and lowest cost option—which is clearly on the horizon for many technologies, including renewable energy and electric cars—we must continue to support emerging markets through incentives and outreach efforts. More than just coordinating among agencies and providing institutional support as described above, we will succeed if we tackle climate change from all angles—through regulatory and policy development, targeted incentives, and education and outreach.

Regulations and Programmatic Development

Our decade of climate leadership has demonstrated that developing mitigation strategies through a public process, where all stakeholders have a voice, leads to effective actions that address climate change and yield a series of additional economic and environmental co-benefits to the State. As we implement this Scoping Plan, State agencies will continue to develop and implement new and existing programs, as described herein. During any rulemaking process, there are many opportunities for both informal interaction with technical staff in meetings and workshops, and formal interaction at Board meetings, Commission business meetings, monthly public meetings, and others. Each State agency will consider all information and stakeholder input during the rulemaking process. Based on this information, the agency may modify proposed measures to reflect the status of technological development, the cost of the measure, the cost-effectiveness of the measures, and other factors before presenting them for consideration and adoption.

Further, to achieve cost-effective GHG reductions, California State agencies must consider the environmental impact of small businesses and provide mechanisms to assist businesses as GHG reduction measures are

implemented. CARB provides resources and tips for small businesses to prevent pollution, minimize waste, and save energy and water on [CoolCalifornia.org](https://coolcalifornia.org). California's small businesses and their employees represent a valuable economic resource in the State and "greening" existing businesses is not only achievable, but sets an example for new businesses which will prove significant as California transitions to a low carbon state.

State agencies conduct environmental and environmental justice assessments of our regulatory actions. Many of the requirements in AB 32 overlap with traditional agency evaluations. In adopting regulations to implement the measures recommended in the Scoping Plan, or including in the regulations the use of market-based compliance mechanisms to comply with the regulations, agencies will ensure that the measures have undergone the aforementioned screenings and meet the requirements established in California Health and Safety Code Section 38562(b)(1-9) and Section 38570(b)(1-3).

Incentive Programs

Financial incentives and direct funding are critical components of the State's climate framework. In particular, incentives and funding are necessary to support GHG emissions reductions strategies for priority sectors, sources, and technologies. Although California has a number of existing incentive programs, available funding is limited. It is critical to target public investments efficiently and in ways that encourage integrated, system wide solutions to produce deep and lasting public benefits. Significant investments of private capital, supported by targeted, priority investments of public funding, are necessary to scale deployment and to maximize benefits. Public investments, including through decisions related to State pension fund portfolios, can help incentivize early action to accelerate market transition to cleaner technologies and cleaner practices, which can also be supported by regulatory measures.

Many existing State funding programs work in tandem to reduce emissions from GHGs, criteria pollutants, and toxic air contaminants, and are helping to foster the transition to a clean energy economy and protect and manage land for carbon sequestration. State law, including Senate Bill 535 (De León, Chapter 830, Statutes of 2012) and Assembly Bill 1550 (Gomez, Chapter 369, Statutes of 2016) also requires focused investment in low income and disadvantaged communities.

The State will need to continue to coordinate and utilize funding sources, such as the Greenhouse Gas Reduction Fund (cap-and-trade auction proceeds), the Alternative and Renewable Fuel and Vehicle Technology Program (AB 118), Electric Program Investment Charge (EPIC) Program, Carl Moyer Program, Air Quality Improvement Program, and Proposition 39 to expand clean energy investments in California and further reduce GHG and criteria emissions. Additionally, programs including the Bioenergy Feed-In Tariff, created by Senate Bill 1122 (Rubio, Chapter 612, Statutes of 2012), Low Carbon Fuel Standard, Cap-and-Trade, Self-Generation Incentive Program, Federal Renewable Fuel Standard, utility incentives pursuant to Assembly Bill 1900 (Gatto, Chapter 602, Statutes of 2012), and others provide important market signals and potential revenue streams to support projects to reduce GHG emissions.

These programs represent just a portion of the opportunities that exist at the federal, State, and local levels to incentivize GHG emissions reductions. The availability of dedicated and long-lasting funding sources is critical to help meet the State's climate objectives and help provide certainty and additional partnership opportunities at the national, State, Tribal, regional, and local levels for further investing in projects that have the potential to expand investments in California's clean economy and further reductions in GHG emissions.

Public Education and Outreach Efforts

California State agencies are committed to meaningful opportunities for public input and effective engagement with stakeholders and the public through the development of the Scoping Plan, and as measures are implemented through workshops, other meetings, and through the formal rulemaking process. Additionally, the State has broad public education and outreach campaigns to support markets for key technologies, like ZEVs and energy efficiency, as well as resources to support local and voluntary actions, such as [CoolCalifornia.org](https://coolcalifornia.org).

In developing this Scoping Plan, there has been extensive outreach with environmental justice organizations and disadvantaged communities. The EJAC launched a community engagement process starting in July 2016, conducting 19 community meetings throughout the State and collecting hundreds of individual comments. To enhance the engagement opportunity, CARB coordinated with local government agencies and sister State agencies to hold collaborative discussions with local residents about specific climate issues that impact their

lives. This effort was well received and attended by local community residents and initiated a new community engagement endeavor for CARB. Recognizing the value of the input received and the opportunity to present California's climate strategy to communities across the State, CARB intends to continue this community involvement to generate awareness about California's climate strategy and be responsive to specific community needs as climate programs are implemented.



EDUCATION AND ENVIRONMENT INITIATIVE

The California Environmental Protection Agency (CalEPA), the California Department of Education, and the California Natural Resources Agency have developed an environmental curriculum that is being taught in more than half of California's school districts. The [Education and Environment Initiative](#) (EEI) provides California's teachers with tools to educate students about the natural environment and how everyday choices can improve our planet and save money.

Conclusion

This Scoping Plan continues more than a half-century of California's nation-leading efforts to clean our air, our water and improve the environment. But, climate change poses a challenge of unprecedented proportions that will, in one way or another, impact all Californians whether they are city dwellers in Los Angeles, San Diego or San Francisco, farmers in Salinas or the Central Valley, or the millions of Californians who live in the Sierra or in the desert areas.

This is the State's climate action plan, and in a very real sense it belongs to all those Californians who are feeling, and will continue to feel, the impacts of climate change. Californians want to see continued effective action that addresses climate change and benefits California – this Plan responds to both of these goals. The Plan was developed by the coordinated consensus of State agencies, but it is really California's Plan, because over the coming decades the approaches in this document will be carried out by all of us.

In this Scoping Plan, every sector in our thriving economy plays a crucial role. Tribes, cities, and local governments are already rising to the challenge, and will play increasingly important roles with everything from low-carbon and cleaner transit, to more walkable streets and the development of vibrant urban communities.

We will see a remarkable transformation of how we move throughout the state, away from cars that burn fossil fuels to cleaner, electric cars that will, in some cases, even drive themselves. Freight will be moved around the state by trucks that are vastly cleaner than those on the road now, with our ports moving towards zero- and near-zero emissions technologies. The heavily traveled Los Angeles-San Francisco corridor will be serviced by comfortable, clean and affordable high speed rail.

In addition to reducing GHGs, these efforts will slash pollution now created from using gasoline and diesel fuel statewide, with the greatest benefits going to the disadvantaged communities of our state which are so often located adjacent to ports, railyards, freight distribution centers and freeways. And, thanks to the continued investment of proceeds from the Cap-and-Trade Program in these same communities, we can continue to work on bringing the benefits of clean technology – whether electric cars or solar roofs – to those in our state who need them the most.

Climate change presents us with unprecedented challenges – challenges that cannot be met with traditional ways of thinking or conventional solutions. As Governor Brown has recognized, meeting these challenges will require "courage, creativity and boldness." The last ten years proved to ourselves, and the world, that Californians recognize the danger of climate change. It has also demonstrated that developing mitigation strategies through a public process where all stakeholders have a voice leads to effective actions that address climate change while yielding a series of co-benefits to the state. This Scoping Plan builds on those early steps and moves into a new chapter that will deliver a thriving economy and a clean environment to our children and grandchildren. It is a commitment to the future, but it begins today by moving forward with the policies in this Plan.

ABBREVIATIONS

AB	Assembly Bill
AC	air conditioning
AEO	Annual Energy Outlook
AHSC	Affordable Housing and Sustainable Communities
ARFVTP	Alternative and Renewable Fuel and Vehicle Technology Program
BARCT	best available retrofit control technology
BAU	business-as-usual
BC	British Columbia
BEV	Battery-electric vehicle
CARB	California Air Resources Board
CAISO	California Independent System Operator
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards
CalPERS	California Public Employees' Retirement System
CalSTA	California State Transportation Agency
CalSTRS	California State Teachers' Retirement System
CAP	Climate Action Plan
CARE	California Alternate Rates for Energy Program
CDFA	California Department of Food and Agriculture
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFT	Clean Fuels and Technology
CH ₄	Methane
CI	carbon intensity
CNRA	California Natural Resources Agency
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
COPD	chronic obstructive pulmonary disease
CPUC	California Public Utilities Commission
CSI	California Solar Initiative
dge	diesel gallon equivalent
DWR	California Department of Water Resources
EA	Environmental Analysis
EEI	Education and Environment Initiative
EIR	Environmental Impact Report
EJAC	Environmental Justice Advisory Committee

EO	Executive Order
EPIC	Electric Program Investment Charge Program
F-gases	fluorinated gases
FCEV	Fuel-cell electric vehicle
FERA	Family Electric Rate Assistance
GCF	Governors' Climate and Forests Task Force
GDP	gross domestic product
GGRF	Greenhouse Gas Reduction Fund
GHG	greenhouse gas
GoBiz	Governor's Office of Business and Economic Development
GWP	global warming potential
HCD	California Department of Housing and Community Development
HFC	Hydrofluorocarbon
HVAC	heating, ventilation and air conditioning
ICAP	International Carbon Action Partnership
IEPR	Integrated Energy Policy Report
IOU	investor-owned utility
IPCC	United Nations Intergovernmental Panel on Climate Change
IRP	integrated resource plan
IWG	Interagency Working Group on the Social Cost of Greenhouse Gases
LCFS	Low Carbon Fuel Standard
LCTOP	Low Carbon Transit Operations Program
LDV	light-duty vehicle
LED	light-emitting diode
LIWP	Low-Income Weatherization Program
LOS	level of service
MMTCO _{2e}	million metric tons of carbon dioxide equivalent
MOU	memorandum of understanding
MPO	metropolitan planning organization
MRR	Regulation for the Mandatory Reporting of GHG Emissions
MTCO ₂	metric tons of carbon dioxide
MW	Megawatt
N ₂ O	nitrous oxide
NAICS	North American Industry Classification System
NEM	Net-Energy Metering
NF ₃	nitrogen trifluoride
NO _x	nitrogen oxide
NZE	near-zero emission
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Governor's Office of Planning and Research

PEV	plug-in electric vehicle
PHEV	Plug-in hybrid electric vehicle
PFC	Perfluorocarbon
PM	particulate matter
PM _{2.5}	fine particulate matter
PMR	Partnership for Market Readiness
REMI	Regional Economic Models, Inc.
RES-BCT	Renewable Energy Bill Credit
RNG	renewable natural gas
RPS	renewable portfolio standard
RTP	regional transportation plan
SB	Senate bill
SCS	Sustainable Communities Strategies
SC-CO ₂	social cost of carbon
SF ₆	sulfur hexafluoride
SGC	Strategic Growth Council
SGIP	Self-Generation Incentive Program
SLCP	Short-lived climate pollutant
SWRCB	State Water Resources Control Board
TBD	to be determined
TCU	Transportation Communications and Utilities
TIRCP	Transit and Intercity Rail Capital Program
UCLA	University of California, Los Angeles
UHI	urban heat island
UIC	International Union of Railways
UNFCCC	United Nations Framework Convention on Climate Change
USDA	U.S. Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
VMT	vehicle miles traveled
WWTP	waste water treatment plant
ZE	zero emission
ZEV	zero emission vehicles

California's 2030 Vision

CAP-AND-TRADE

Firm limit on 80% of emissions



CLEAN ENERGY

At least 50% renewable electricity

Double energy efficiency in existing buildings

CLEAN FUELS

18% carbon intensity reduction

High density, transit-oriented housing

NATURAL & WORKING LANDS RESTORATION

15-20 million metric tons of reductions

REDUCE "SUPER POLLUTANTS"

40% reduction in methane and HFCs

Walkable & bikable communities

On-road oil demand reduced by half

CLEAN CARS

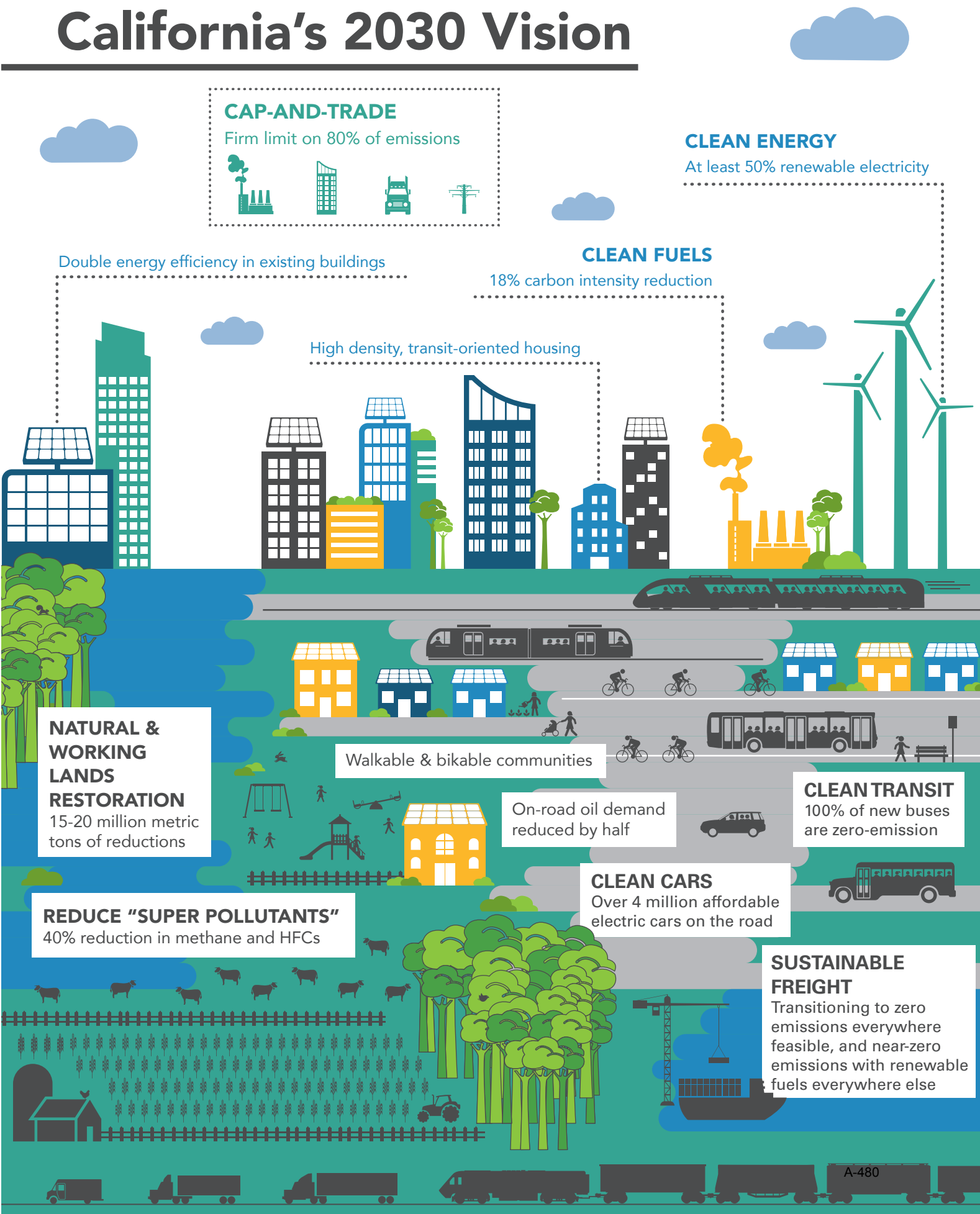
Over 4 million affordable electric cars on the road

CLEAN TRANSIT

100% of new buses are zero-emission

SUSTAINABLE FREIGHT

Transitioning to zero emissions everywhere feasible, and near-zero emissions with renewable fuels everywhere else



City of Berkeley DRAFT LOG - LARGE PROJECTS UNDER REVIEW, MARCH 2019			
Site		Description	Status
1835	SAN PABLO	Demolition of existing 1-story commercial structure and construction of new 6-story mixed use building with 95 dwelling units, ground-level lobbies, parking and 4 live-work units, with State of California Density Bonus.	Application submitted 11/19/18; Interdepartmental Roundtable 1/23/19; applicants resubmitted 2/4/2019; UPP under contract for CEQA Services 2/6/2019
2100	SAN PABLO	Use Permit Modification to an approved Use Permit (ZP2016-0034) for a 4-story mixed-use development containing a 96-unit residential care facility for elderly for ground-floor commercial use to be used for restaurants, arts/crafts studio, club/wellness center, car share and bicycle parking. The modifications include reduction for parking count and addition of gross floor area	Application submitted 11/26/18; applicants resubmitted 1/17/2019; DRC Mod 2/21/19, received favorable recommendation w/conditions for FDR; Traffic and Parking documents under review.
2628	Shattuck	Demo of existing care facility, construction of 6-story mixed-use building with 78 DUs	Application received 3/6/18; incomplete letter sent 4/3. Interesting conversation with Fire regarding aging firestations.
811	Carleton	Master Use Permit for Macaulay Foundry	No current application. Staff met with the owner's son and a new project team on 9-13-17. Previous applications proposed a "maker space" with multiple uses and were closed due to lack of information. Building Permit to repair fire damage approved in Feb 2018. Per 5-14-18 conversation, applicant is getting ready to submit a pre-application.
3031	ADELINE	Demolish an existing 1,000 square foot commercial building and construct a 5-story, 57' tall, 46,948 square foot mixed-use building with 42 dwelling units, 4,324 square feet of commercial space, and 25 parking spaces on a 12,257 square foot lot.	Application filed 7/24/18. Deemed incomplete 8/23/18 (lots needed, esp. technical reports).
2099	MLK (at Addison)	pre-application review of proposed six-story mixed use project; 72 DUs over 2,462 sq ft GF retail and 27 parking spaces, on the site of Good Year.	Applicant wants to review density bonus base project and calculation. Roundtable held 2/13/19.
2009	Addison	Berkeley Rep - UP MOD to rent some of the 45 residential units to other art group	UP Mod Application filed 12/13/18; ZAB approved 1/24/19
2072	Addison	UP Mod to remove parking from approved mixed-use building with 66 dwelling units.	Staff Report to be drafted, anticipate May ZAB
1155	HEARST	Add 6 units on two lots with 7 existing units (Including BMR units). Combined to create 21,920 sq ft	Approved at ZAB August 23. Approval appealed by neighbors; to Council January 29; remand to ZAB - go in 90 days: April 25, 2019
1951	SHATTUCK	mixed use 120' building; 156 DUs, 4,000 + sq ft gf retail, 100 parking spaces.	ZAB preview 11/8; feed back on architecture. Preliminary review at DRC in March.
2190	SHATTUCK	10,000 sq ft of GF retail space, 274 DUs, 103 parking spaces	Approved at ZAB October 25th. Approval upheld at City Council January 31.
2198	SAN PABLO (at Allston)	6 story mixed use building; 56 DUs	Application submitted 6/4/18. Previews at ZAB and DRC held. Anticipate review May.
0	SAN PABLO (at Dwight)	4 story mixed use - ground floor commercial plus three floors GLA	incomplete letter sent out 1/2/19; roundtable to be held April 10.
1900	FOURTH	30,000 sq ft GF commercial, 155 DUs, replacement parking	Draft EIR out for public review Nov 16 - Mar 13. 800 +/- Comment letters. Meeting to discuss path forward 2/1/18 -- On Hold as of 4/5/18
1900	FOURTH	27,500 sq ft GF commercial, 260 DUs, replacement parking	SB35 application submitted March 8. 30 day incomplete letter sent April 6. 90-day letter to sent June 5 with determination that elements are inconsistent with objective standards. Response submitted June 28. Denied September 4. Lawsuit received November 28, 2018.

2795	SAN PABLO (Ward/Oregon)	Pre-application review for demolition of a single-family dwelling and construction of a 3-story, 40' tall, 5,309 square foot residential building with 4 dwelling units and 4 parking spaces on a 4,076 square foot lot.	Filed 7/27/18. Currently under review. Roundtable held 09/19/2018. No zoning issues with design. Project subject to in-lieu fee because lot is zoned for 5+units.
2701	SHATTUCK	Demolish an existing mixed-use building and construct 5-story, 61' tall, mixed-use building with 57 units, 30 parking spaces, and 600 square feet ground floor commercial space.	11/8/18 Approved by ZAB 12/3/18 Appeal to City Council received. Scheduled for 3/12 CC.
1110	UNIVERSITY	Demolish existing mixed-use building (elimination of 8 rent controlled units) and construct 5-story, 55' tall, mixed-use building with 36 units, no parking spaces, and 1,654 square feet ground floor commercial space. Cortese List site occupied by dry cleaners on ground floor.	ZAB review 8/23, continued to 10/25 to flesh out relocation requirements. 9/24/18 Applicant indicated project is on hold, with no further activity planned.
1486 & 1498	UNIVERSITY	Demolish existing mixed-use building (elimination of 7 rent controlled units) and construct 4-story, 48' tall, mixed-use building with 44 units 28 parking spaces and 1,800 square feet ground floor commercial space. Cortese List site which was formerly a gas station, now occupied by children's day care on ground floor.	Project on hold pending finalization of replacement units. Working with applicant to explain decisions made in the context of 1110 University.
2352	SHATTUCK	8-story mixed use building, 237 DUs (Staples block)	3/7/2019 CEQA consultant selected - Rincon 3/13/19 Roundtable Meeting
3031	TELEGRAPH	Demolish existing 22,066 SF medical office and construct a 5-story mixed use building including 95 dwelling units, 6388 SF ground level commercial space and one level of underground parking. PRE APPLICATION REVIEW.	1/22/19 Density bonus proposal submitted; staff to review. Roundtable meeting scheduled 4/10/19.
2015	BLAKE	New multi-family residential building with 155 dwelling units and underground parking. Density Bonus project	2/15/2019 Incomplete sent.
2028	BANCROFT	6 story residential, 33,539 sq ft, 37 DUs, (1.8 affordable)	Roundtable held 10/11/17, ZAB Preview 3/8/18; ZAB 2/14/19 approved on consent.
2025	Durant	removal of eastern parking lot, 2 new dweling units, reconfigure to construct shared coutryard with 2028 Bancroft	Roundtable held 10/11/17, ZAB Preview 3/8/18; ZAB 2/14/19 approved on consent.
1940	Haste	reciever site of existing brown shingle from 2028 Bancroft	Incompletness letter issued 8/25/17, resubmittal 10/2/17 ZAB Date TBD per applicants request to clarify rent control/BMR units on 1212 Durant source site of existing relocated multi dwelling structure waiting to be permanently placed in rear of lot.
2720	SAN PABLO	5 story Mixed Use, over 3,163 sq ft commercial, GF, 40 DUs (4 Affordable units),32 parking spaces 53 bicycle spaces	Application Deemed Complete: 10/8/2017 DRC prelim (as Cat Ex on 11/2016) new prelim expected, pending IS. May 11, 2017: Applicant resubmitted on 9/10/2018
1601	Oxford	Use Permit Submitted Four-story, 34 income-restricted =units for seniors (and units for church).	ZAB preview held 7/12, pending DB base project plans. Scheduled for ZAB on 11/8/2018 concurrently preparing SB 35 application. Appeal submitted 12/4/18. Approved per SB 35 12/21/19.
1050	Parker	Modification of previously approved UP to full Medical Office	Submitted 6/4,draft IS-MND published 8/31, ZAB hearing on 10/25/2018, continued to 12/13/2018, approved 1/24/19, appealed 2/16/19. CC rezone 12/4/2018 con't to 1/24/2019, approved. Appeal scheduled for April 30
2700	Tenth	Off site parking for 1050 Parker mod	Submitted 6/4,draft IC-MND published 8/31, ZAB hearing on 10/25/2018, continued to 12/13/2018. CC rezone 12/4/2018 con't to 1/24/2019, denied 1/24/19. Appeal received 2/16/19, scheduled for CC April 30
2613	SAN PABLO (Parker/Carleton)	Outdoor food services, Beer and wine. More requested from traffic (getting pushback). Agreed that noise analysis would be COA.	Application resubmitted on 10/19/2018. Meeting with applicant 1/14/19 regarding redesign. Resubmitted on 2/26/19, under review.



Gavin Newsom
Governor

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit



Kate Gordon
Director

Letter A 9

April 15, 2019

Raphael Breines
University of California, Berkeley
300 A&E Bldg.
Berkeley, CA 94720-1382

Subject: Upper Hearst Development for the Goldman School of Public Policy and Minor Amendment to the 2020 LRDP
SCH#: 2003082131

Dear Raphael Breines:

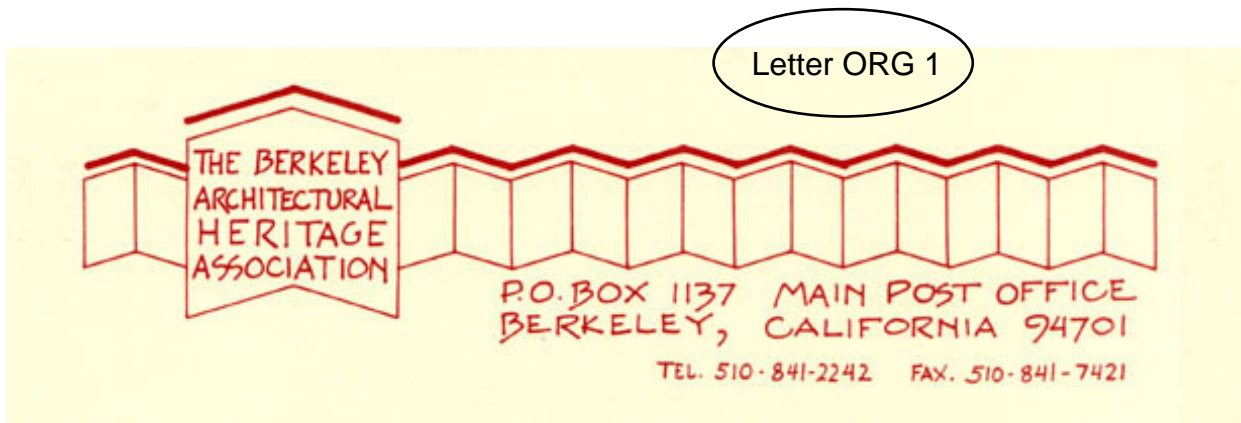
The State Clearinghouse submitted the above named EIR to selected state agencies for review. The review period closed on 4/12/2019, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act, please visit: <https://ceqanet.opr.ca.gov/2003082131/30> for full details about your project.

A 9.1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse



March 11, 2019

Vini Bhargava, PMP, LEED AP
Director, Physical & Environmental Planning
300 A&E Building
UC Berkeley
Berkeley, CA 94720-1382

Re: Draft Supplemental EIR, 2020 LRDP/Upper Hearst Development

Dear Ms. Bhargava:

The Berkeley Architectural Heritage Association (BAHA) reviewed the Draft SEIR and is offering its comments on the following topics contained therein:

- **Chapter 5. Cultural Resources**
- **Proposed Project and Alternatives**

Chapter 5. Cultural Resources

Chapter 5 is inadequate and poorly researched. The very few sources cited are outdated by several decades. The writers of this chapter made no effort to consult more recent and more thoroughly researched resources, even when those sources are readily available. It is glaringly evident that the BAHA website, where a dedicated and robust section is devoted to Northside Landmarks, was not consulted.

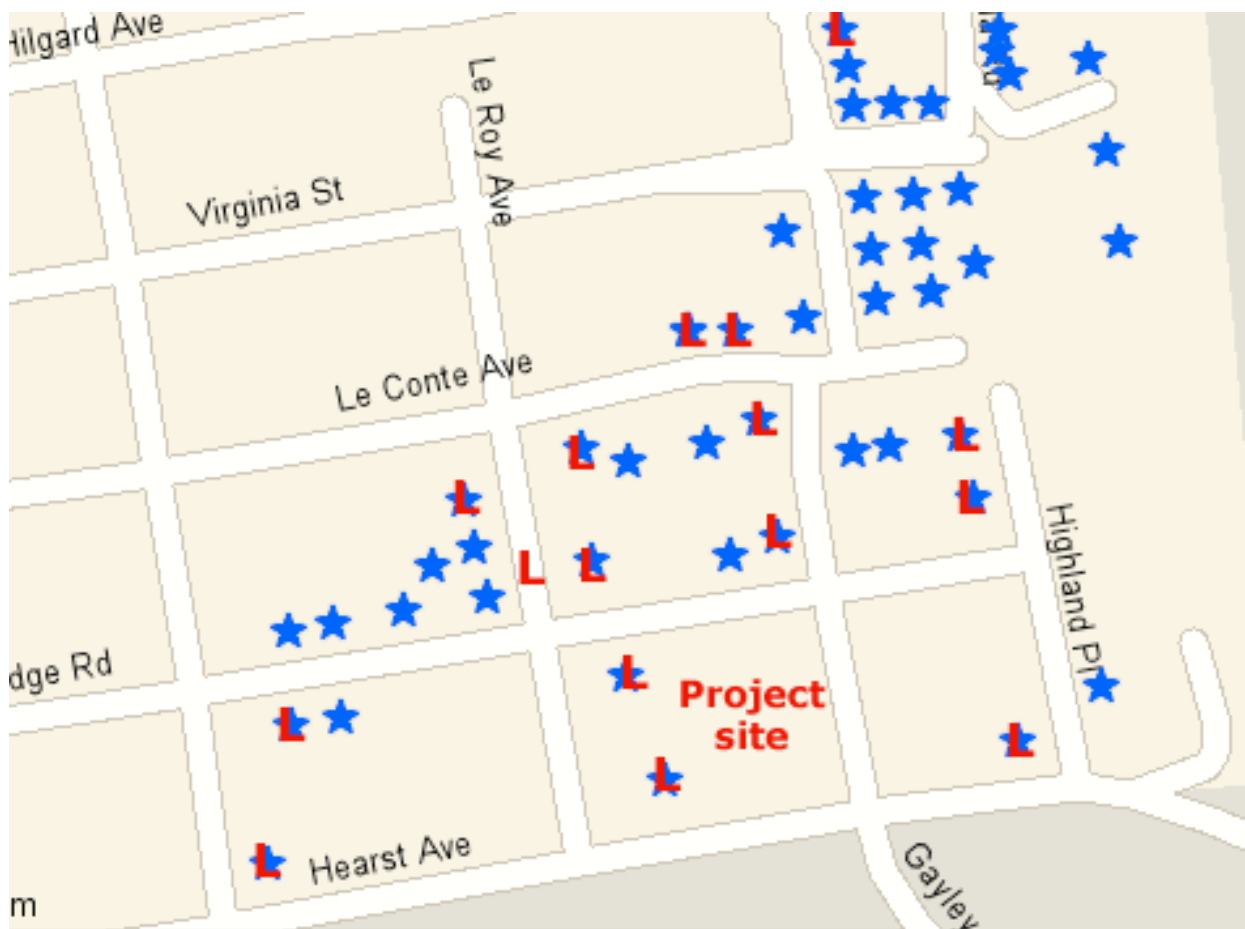
Northside Landmarks

http://berkeleyheritage.com/berkeley_landmarks/northside.html

The historic resources cited in Chapter 5 comprise a paltry four: Founders' Rock; the two landmark structures standing on the proposed project's block; and a solitary building across the street (Phi Kappa Psi Chapter House), which was designated a City of Berkeley Landmark in 2006 but is not identified as such in the SEIR.

Chapter 5 ignores many other designated structures in the immediate vicinity. It should be noted that the City of Berkeley's Landmarks Preservation Commission has recognized all structures in Daley's Scenic Park (DSP) that survived the 1923 Berkeley Fire as historic resources. Figure 1 below shows the concentration of 1923 Fire-surviving DSP structures in the vicinity of the proposed project area. The superimposed red L letters on the map denote designated structures or sites.

ORG
1.1



ORG
1.1

Figure 1. 1923 Fire survivors in the vicinity of the project site (L denotes a designated landmark.)

We should point out that the blocks south of Ridge Road between Highland Place and Euclid Avenue did not burn in 1923, yet they lost a large number of historic structures as a direct result of the University of California's past actions.

Indeed, the Upper Hearst parking structure and its companion parking lot would not exist had it not been for the demolition of three historic structures:

- **College Hall**, the first dormitory for women, 2627 Hearst Avenue (1908–09)
- **Newman Hall**, 2630 Ridge Road (Shea & Lofquist, 1909–10)
- **Phi Kappa Psi Chapter House No. 2**, 2625 Hearst Avenue (Harris C. Allen, 1915)

ORG
1.2

The **Alpha Kappa Lambda Chapter House**, 2701 Hearst Avenue (Kimball & Sprague, 1916), and the **Hansen House**, 1811 La Loma Avenue (Frank M. May, 1909) were lost under similar circumstances.

Figures 2–6 below show five lost historic structures that stood on the project site or directly across La Loma Avenue. These buildings are examples of the historic neighborhood's architectural styles whose elements and materials might provide inspiration for a neighborhood-compatible design of the new buildings.



Figure 2. Newman Hall and Phi Kappa Psi Chapter House (BAHA archives)



Figure 3. College Hall and Newman Hall (BAHA archives)



Figure 4. Alpha Kappa Lambda Chapter House, 2701 Hearst Ave, 1917 (courtesy of Anne Schnoebelen)



Figure 5. Hansen House, 1811 La Loma Avenue, 1917 (courtesy of Anne Schnoebelen)



Figure 6. Phi Kappa Psi Chapter House No. 2, 2625 Hearst Avenue

ORG 1.2

Below is our listing of 1923 Berkeley Fire-surviving structures located in the vicinity of the project site.

On the same block

Beta Theta Pi Chapter House, 2607 Hearst Avenue (Ernest Coxhead, 1893), *City of Berkeley Landmark*

Cloyne Court Hotel, 2600 Ridge Road (John Galen Howard, 1904), *National Register of Historic Places; City of Berkeley Landmark*

Across Ridge Road to the north

Phi Kappa Psi Chapter House, 2627 Ridge Road / 1770 La Loma Avenue (Harris C. Allen, 1901), *City of Berkeley Landmark*

Hunt House, 2625 Ridge Road (George Frederick Estey, 1896)

Freeman House, "Allanoke," 1777 Le Roy Avenue (Ernest Coxhead, 1903), *City of Berkeley Landmark*

Across La Loma Avenue to the east

Phi Delta Theta Chapter House, 2717 Hearst Avenue (John Reid, Jr., 1914), *National Register of Historic Places; City of Berkeley Landmark*

Psi Upsilon Chapter House, 1815 Highland Place (Benjamin G. McDougall, 1912)

Keeler House, 1770 Highland Place (Bernard Maybeck, 1895), *City of Berkeley Landmark*

Keeler Studio, 1736 Highland Place (Bernard Maybeck, 1902), *City of Berkeley Landmark*

Ridge Road to Le Conte Avenue (next block to the north)

Hillside Club Street Improvements (1909), *City of Berkeley Landmark*

Bitting House, 1731 La Loma Avenue (F. E. Armstrong, 1902)

Bitting Cottage, 1731a La Loma Avenue

Theta Xi Chapter House, 1730 La Loma Avenue (Drysdale & Thomson, 1914), *City of Berkeley Landmark*

Hatfield House, 2695 Le Conte Avenue (Julia Morgan & Ira Hoover, 1908)

Atterbury House, 2656 Le Conte Avenue (McCrea & Knowles, 1898), *SHRI, 3S*

Bentley House (A. H. Broad, 1900), *City of Berkeley Landmark*

Kluegel House, 2667–2669 Le Conte Avenue (John Hudson Thomas, 1911), *City of Berkeley Landmark*

Moody Studio-Dornin House, 2634 Le Conte Avenue (1914 & 1926)

Moody House, "Weltevreden," 1755 Le Roy Avenue (A. C. Schweinfurth, 1896), *City of Berkeley Landmark, Structure of Merit*

Le Roy Avenue to Euclid Avenue (next block to the west)

Oscar Maurer Studio, 1772 Le Roy Avenue (Bernard Maybeck, 1907), *City of Berkeley Landmark*

Marx-Maurer House, 1776 Le Roy Avenue (F. E. Armstrong, 1905)

Blossom House, 1780 Le Roy Avenue (F. E. Armstrong, 1904)

Allanoke Carriage House, 2533 Ridge Road (Clarence Tantau, 1919)

Peterson House, "North Gables," 2531 Ridge Road (1892)

Treehaven Apartments, 2523 Ridge Road (George W. Patton, 1909), *SHRI, 3S*

Sigma Alpha Epsilon Chapter House, 2519 Ridge Road (1906–07)
Inverness Apartments, 2516–20 Ridge Road (1892; Plowman & Thomas, 1910)
Bennington Apartments, 2508 Ridge Road (1892; 1915), *City of Berkeley Landmark*

↑
ORG 1.3

We can't help but conclude that the SEIR, while paying grudging lip service to the cultural importance of Daley's Scenic Park, stops short of addressing the neighborhood's historic resources in the vicinity of the project site. This neglect is also apparent in the total lack of sensitivity shown in the design for the two proposed project buildings.

ORG 1.4

Proposed Project and Alternatives

Proposed Project

The proposed project as described in 1.1 PROJECT SUMMARY has been widely condemned in the community for being too massive, too tall, too inharmonious with nearby historic resources, and too insensitive to the adjacent historic neighborhood.

ORG 1.5

BAHA joins the Landmarks Preservation Commission, the Northside Neighborhood Association, and many members of the community in finding the proposed project entirely unacceptable.

We recently heard that UC Planning staff is now proposing a somewhat downscaled version of the project, which would entail demolishing the Upper Hearst parking structure and reducing the height of the residential component from six to five stories. While we welcome the demolition of the parking structure, we find that a five-story building is still too tall and massive for this location. No building on the site should be taller than the Foothill housing complex across the street.

ORG 1.6

Furthermore, we understand that the unsympathetic design proposed for both academic and residential components remains unchanged, leading us to protest against this approach.

Academic Building Only Alternative

"[...] this alternative would place the academic building on the northern portion of the site, where it would replace the Ridge surface parking lot. [...] The new academic building also would be reduced to two stories in height, but it would have a similar floor area to the proposed Project (37,000 square feet), by occupying a larger building footprint."

ORG 1.7

Locating the new academic building away from the historic Beta Theta Pi Chapter House and reducing its height to two stories is an attractive proposition. If this alternative is adopted, we would hope that the building's design will reflect greater sensitivity to the surrounding historic fabric than is evident in the current proposed project's design.

Reduced Scale Alternative

"By reducing the floor area of new buildings, the academic building's height would be reduced from four to three stories, while the residential building would be reduced from up to six to four"

↓
ORG 1.8

stories. The new buildings would have increased setbacks from streets relative to the proposed Project."

This alternative, which also assumes a complete demolition of the Upper Hearst parking structure, appears to be a win-win situation, provided the building exteriors are redesigned to take the neighborhood's history and fabric into account.

BAHA is not opposed to additional academic facilities for the Goldman School, or to the construction of much-needed faculty housing on this site. It is not the program, but the insensitive massing and inappropriate architectural character of the proposed buildings that poison the project as it currently stands, and should be corrected.

Sincerely,

A handwritten signature in black ink that reads "Carrie Olson". The signature is fluid and cursive, with the first name "Carrie" written in a larger, more prominent script than the last name "Olson".

Carrie Olson
Corporate Secretary

↑
ORG 1.8



UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO • SANTA BARBARA • SANTA CRUZ

BERKELEY, CALIFORNIA 94720-1740
COLLEGE OF ENGINEERING

DATE: March 19, 2019

TO: Carol Christ, Chancellor (cchrist@berkeley.edu)
Paul Alivisatos, Executive Vice Chancellor (paul.alivisatos@berkeley.edu)
Ben Hermalin, Vice Provost for the Faculty (hermalin@berkeley.edu)
Lisa Alvarez-Cohen, Vice Provost for Academic Planning (lisaac@berkeley.edu)
Rosemarie Rae, Vice Chancellor for Finance (rrae@berkeley.edu)
Marc Fisher, Vice Chancellor for Administration (marcfisher@berkeley.edu)
Barbara Spackman, Chair of the Academic Senate (spackman@berkeley.edu)
Oliver O'Reilly, Vice Chair of the Academic Senate (oreilly@berkeley.edu)
Raphael Breines, Senior Planner (rbreines@berkeley.edu)

FROM: College of Engineering Ad-Hoc Committee for Review of GSPP Development Project

- Dorit Hochbaum (IEOR, hochbaum@ieor.berkeley.edu)
- Peter Hosemann (NE, peterh@berkeley.edu)
- Sanjay Kumar (BIOE, skumar@berkeley.edu)
- Kris Pister (EECS, ksjp@berkeley.edu)
- Nicholas Sitar (CEE, sitar@berkeley.edu)
- Ting Xu (MSE, tingxu@berkeley.edu)
- Eli Yablonovitch (EECS, eliy@eecs.berkeley.edu)
- Tarek Zohdi (ME, Chair of the COE Faculty, zohdi@berkeley.edu)

RE: Goldman School of Public Policy Upper Hearst Project and Proposed Demolition of Upper Hearst Parking Structure

Reflecting the broad sentiments of the College of Engineering (COE) community, we are hereby conveying our serious concerns over the proposed conversion of the Upper Hearst parking structure and the process by which this project was developed. Of particular concern is the lack of due diligence in reaching out to stakeholders within the UC Berkeley campus community, as well as a lack of adequately planned alternatives to compensate for the loss of readily accessible parking in the northeast section of campus. The concerns of the COE community fall into three broad categories:

ORG
2.1

- 1) Lack of transparency, consultation, and adequate communication about the Upper Hearst project with COE faculty and staff, arguably the largest stakeholder in the northeast section of the Berkeley campus.
- 2) Absence of due consideration of the effects of parking dislocation and increased commuting time to be imposed on hundreds of campus employees;
- 3) Misrepresentation of the intent of the overall project to the campus community, UC Board of Regents, and the public.

ORG 2.2

ORG 2.3

ORG 2.4

Many faculty colleagues and staff members of the COE already have submitted their concerns directly. Thus, herein, we concentrate our specific comments on the three points above, as follows:

- 1) There was inadequate consultation about the proposed development project with COE leadership, faculty and staff. To have the smallest academic unit (Goldman School of Public Policy) in the district effectively dictate the use of the space that serves a much larger segment of the Berkeley campus community is simply not in keeping with the academic governance and shared stewardship of our physical facilities and overall quality of our work environment. Consultation and collaboration are essential if (rational and effective solutions serving a common goal are the objective. In this regard, there is no excuse for the way the project planning evolved essentially in near secrecy. Thus, it is hard to avoid suspicion of intent rather than omission. We hope that, going forward, this situation can be remedied and that an appropriate consultative process will be put in place.

ORG 2.5

- 2) The most direct impact of the proposed project is on access to parking in the northeast district of the campus. The Upper Hearst parking garage (a 4-story structure) currently has a capacity of 390 parking spaces. Specifically:

- The lot is already fully utilized, necessitating the use of stacked parking for more than 40 spaces when attendants are available.
- The entire structure is restricted to C and F permit parking, with public parking available after 5 pm.
- During the 24-month construction period to begin in the fall of 2019, all 390 spaces would be eliminated. Faculty and staff who regularly parked at the Upper Hearst site are expected to find alternative parking spots at the Foothill parking lot, Maxwell Family Field parking lot, or at the Clark Kerr campus.
- There will be a permanent loss of 310 spots after construction is completed. This number stems from the following calculation: 170 spots will be available upon completion, and 90 will be reserved for residents of the new housing proposed on the site; thus, only 80 spots will be available for C and F permit holders. There would be less if some of those spots are reserved for GSPP.

ORG 2.6

The long-term parking solution envisioned in the proposal is a combination of

- Foothill lot (100-125 spots), which requires a dangerous walk up a steep incline with no lighting or sidewalk on the south side of Cyclotron Road. This is not appropriate for disabled access;
- Clark Kerr campus (100-125 spots) which is at least a 20-minute walk, one-way, from the nearest COE building and with very limited shuttle service.
- Maxwell Field parking garage (100-125 spots), which is a privately run facility.

ORG 2.7

It is obvious that this plan has not undergone due diligence or rational analysis, since all three alternative parking areas combined barely constitute 310 parking spots to compensate for the lost parking spaces at the Upper Hearst site. In reality, the number of available spaces is far lower than promised. The Foothill lot is regularly full by late morning, even without the demolition of Upper Hearst parking, and Clark Kerr lots are full when conferences are meetings are held at the site. In this context, the notion of a shuttle service that would provide timely access to any of these parking areas defies common sense, as anyone who has travelled the Gayley Road corridor during peak commute times can attest. Gayley Road to Piedmont Ave is currently an extremely crowded traffic artery. The additional impact of shuttles and cars/people "hunting" for an available parking spot makes a mockery of any notion of saving on CO₂ emissions. *The*

additional congestion and carbon footprint from faculty and staff attempting to locate parking in this decentralized “plan” goes against the core principles of UC Berkeley. ↑ ORG 2.7

The Supplemental Environmental Impact Report for the proposed project engages in a fictional narrative implying that employees will have ready access to alternative means of transportation to the Berkeley campus. The simple fact is that many employees of the university in search of affordable housing live in areas that provide opportunity for affordable housing for campus employees of all ranks are found in areas that do not lie directly along public transportation routes. Hence, their commute to campus is not a matter of convenient choice borne out of laziness; rather it is an absolute necessity in order to bring commute time to an acceptable minimum and to provide flexibility needed for off-campus engagements and commitments. Hence, the already expensive paid parking in reasonable proximity to the place of work is a necessity, not a luxury. The callous treatment of faculty and staff is compounded by the already high price of parking, and will be further compounded by the cost in personal time to faculty and staff, affecting their already long commutes and their families (for example, childcare).

ORG 2.8

- 3) The proposed development project has been advertised as a means to increase housing opportunities for students in close proximity to campus. However, the project, as now detailed, suggests the building of 150 residential housing units at or near market rates, pricing most students out. The latest documents for the project now specify faculty, visiting scholars, graduate students and postdoctoral scholars as possible residents. Given the proposed private entity ownership of the housing project, there is no market analysis to show that in fact there is University community demand for such a project in that location and that the project will not simply provide another set of apartments for the general public. Beyond the transparency issues and clear deviation from the originally stated intent as presented to the UC Regents and the public, the economic viability and benefit to the campus has not been analyzed or presented in any substantive detail that would stand up to financial scrutiny.

ORG 2.9

In conclusion, in light of the aforementioned concerns, *we respectfully ask for a meeting between the upper administration involved in this project and the COE faculty and staff, during regular business hours, before **April 20th**. We would appreciate a response to this proposal before **March 30**. Furthermore, we ask that the Academic Senate formally review the entire proposed development project.*

ORG 2.10



March 21, 2019

University of California, Berkeley
Office of the Vice Chancellor of Finance
Capital Strategies
Re: Draft Supplemental EIR

Letter ORG 3

Dear UC Berkeley Capital Strategies,

On behalf of the Associated Students of the University of California, we are writing to express our concern that the Draft EIR does not comprehensively assess the impacts of enrollment growth at UC Berkeley. The state is growing, and so should our public universities. However, we cannot pretend that this does not affect the student experience or the surrounding community.

The campus has grown by 9,000 students more than the expected amount outlined in the Long Range Development Plan, but housing development has not kept pace. As a result, students are couchsurfing and living in their cars. When students are forced to live further from campus, we exacerbate gentrification in the city. The campus must be held accountable to building more student housing — not only is it the best down payment the university can make, but the right thing to do in the midst of Berkeley's housing crisis.

ORG 3.1

We also believe that students have a right to a safe campus community. That means accessible emergency services and promoting safe, walkable nighttime environments. Snatch-and-grab robberies have become an increasingly significant issue affecting students. The campus must fund lighting installations on the Southside where a good portion of UC Berkeley students reside. To further address this, UCPD and BPD should work together to provide community policing, not over-policing. Students also need to know that emergency services will respond quickly to situations in the campus community when they arise. More people means more emergencies, and the Fire Department does not have enough resources to accommodate the enrollment growth. The campus must fund another ambulance for the city, especially in light of the potential closure of Alta Bates.

ORG 3.2

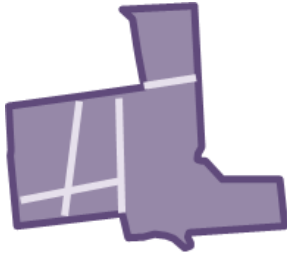
Finally, there are an increasing number of environmental concerns as enrollment increases. Since housing is scarce and expensive near campus, students and faculty are living further away, promoting the use of vehicles in their daily commutes. To circumvent this, students need increased transportation options to live green, walkable lifestyles. The campus should fund bus improvements and bike lanes along Telegraph and College Avenue. The campus also needs to do more to meet its climate goals. We need to electrify campus now and ensure that we reduce waste, reduce emissions, and go carbon neutral. The trend of the current circumstances are environmentally detrimental and the campus must do more to offset these harms.

ORG 3.3

We hope that as the campus welcomes its new Golden Bears, it also takes responsibility for the impacts that these students have on housing supply, city resources, and the environment.

Sincerely,

Alexander Wilfert, ASUC President
Nuha Khalfay, ASUC External Affairs Vice President (EAVP)
Kylie Murdock, EAVP Chief-of-Staff
Sarah Abdeslahian, EAVP Campus Organizing Director
Angie Chen, EAVP Local Affairs Director
Raphael Villagracia, EAVP Local Programs Manager
Somya Jain, EAVP Local Organizing Manager
Amir Wright, ASUC Senator
Ammam Sarkodee-Adoo, ASUC Senator
Andy Theocharous, ASUC Senator
Anne Zepecki, ASUC Senator
Idalys Perez, ASUC Senator
Imran Khan, ASUC Senator
Isabella Chow, ASUC Senator
James Li, ASUC Senator
Karina Sun, ASUC Senator
Nikhil Harish, ASUC Senator
Regina Kim, ASUC Senator
Saakshi Goel, ASUC Senator
Stephen Boyle, ASUC Senator
Teddy Lake, ASUC Senator
William Wang, ASUC Senator
Zach Carter, ASUC Senator



Letter ORG 4

SOUTHSIDE NEIGHBORHOOD CONSORTIUM

April 12, 2019

Raphael Breines
Senior Planner Physical & Environmental Planning
University of California, Berkeley
300 A&E Building
Berkeley, CA 94720-1382

Re: Comments on Draft Supplemental EIR for Upper Hearst Development Plan for Goldman School of Public Policy (GSPP) and Minor Amendment to the 2020 Long Range Development Plan (2020 LRDP)

Dear Mr. Breines:

The Southside Neighborhood Consortium (SNC) is a consortium of neighborhood associations and it speaks on behalf of over 1,000 of its constituent association's members. SNC has reviewed the Draft Supplemental EIR for Upper Hearst Development Plan for Goldman School of Public Policy and Minor Amendment to the 2020 Long Range Development Plan (Draft SEIR) prepared by the University of California, Berkeley (UCB) and has prepared the following comments.

The Project description is uncertain because while the NOP directly asserts the increase in student enrollment above the 1,650 increase projected in 2005 is part of the "project," the Draft SEIR equivocates on this commitment. Instead, the Draft SEIR has artfully included the increase in student enrollment above the 1,650 increase projected in 2005 in the "baseline" or "environmental setting" rather than in the "project description." As a result, the reader is left guessing as to whether the Draft SEIR actually evaluates the environmental impacts of increases in student enrollment above the 1,650 increase projected in 2005.

ORG 4.1

1.1 Project Summary (page 2 of the Draft SEIR)

SNC Comment 1.1-1: The Project Summary is highly misleading to the general public and is materially deficient by not completely quantifying the scope of the Project. The August 15, 2018 NOP says "The

↓ ORG 4.2

need for a Supplemental EIR is primarily triggered by two issues: (1) changes to the 2020 Long Range Development Plan (2020 LRDP) land use plan to accommodate the proposed project; and (2) an increase in current and foreseeable campus population levels above those analyzed in the 2020 LRDP EIR, based on a general increase in student enrollment and employee levels and growing the GSPP program(s). The Draft Supplemental EIR will analyze whether these issues would result in new or substantially more severe significant impacts than identified in the 2020 LRDP EIR. Under CEQA, the Draft Supplemental EIR will analyze the environmental effects associated with the GSPP program development on a project level and the increased campus population on a programmatic level.”

↑
ORG 4.2

The Project Summary buries an element of the project that might have the greatest impact: a change in base student population of up to 11,285 new students¹, of which approximately 9,000 have already been added (in apparent violation of the 2020 LRDP). The Draft SEIR in Table 4 indicates that this increase in student enrollment is 33.7 percent over the 2020 LRDP projected headcount for Year 2020. The Draft SEIR on page 3 states that “[t]he Draft SEIR also establishes an updated population baseline to reflect the existing campus headcount (which is greater than the projections in the 2020 LRDP)....” This update is a major element of the project and is not quantified in the Executive Summary even though the other elements of UCB’s proposed project are described in great detail.

SNC Comment 1.1-2: The update of the base student population is presented in the Project Summary as an “updated population baseline.” It is referenced later in Section 3.6 as part of the “Planning Context.” This treatment of this element of the Project is incorrect and the Project Description is materially deficient. The increase in student enrollment is itself a major element of the Project with potentially significant impacts that could exceed the impacts of other Project program components. The increase in student enrollment, including past increases that are over and above the increase of 1,650 students projected in the 2005 EIR for the 2020 LRDP and expected future increases must be presented as a major element of the Project. This component constitutes a major, not “minor” amendment of the 2020 LRDP. SNC believes that UCB is acting in bad faith by attempting to hide a major increase in student enrollment from the City of Berkeley and its residents as an environmental setting or baseline update. In addition, the contention that “the UC Berkeley campus is still operating within the capacity and demand identified and analyzed in the 2020 LRDP EIR for resources such as housing, water, electricity and public services, among others” fails to account for the impacts of the increase in student enrollment, including past increases that are over and above the increase of 1,650 students projected in the 2005 EIR for the 2020 LRDP and expected future increases. The affected environment for these impacts is the area around the campus in the City of Berkeley. The EIR fails to assess these impacts on the affected environment.

ORG 4.3

SNC Comment 1.1-3: SNC supports the student housing component of the Project and believes that by mixing it with the increase in student enrollment, UCB will, through its bad faith handling of description and analysis of the overall Project, unduly delay the implementation of the student housing component.

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ORG 4.4

¹ This figure is derived from the data presented in Table 4 of the Draft SEIR.

Therefore, SNC requests that UCB separate the increase in student enrollment from the Project Description and undertake a new CEQA action to study the enrollment increase.

↑ ORG 4.4

SNC Comment 1.1-4: Since the Project Description is materially deficient by not adequately describing and quantifying the proposed increase in student enrollment as a major amendment or supplemental action to the 2020 LRDP, UCB has to date provided materially deficient notices to the public regarding all aspects of its SEIR process and CEQA-mandated procedures.

ORG 4.5

SNC Comment 1.1-5: See SNC Comment 8.1 for Project Alternatives

SNC Comment 1.1-6: *Table 1: Summary of Significant and Unavoidable Impacts.* UCB's summary fails to address any of the issues raised by enrollment growth.

ORG 4.6

2.2 Type of Environmental Impact Report (page 7 of Draft SEIR)

SNC Comment 2.2-1: An enrollment increase of the order of 33.4 percent clearly falls under CEQA guidelines Section 15162, thereby requiring that enrollment be studied as part of a subsequent EIR rather than a supplemental EIR.

ORG 4.7

SNC Comment 2.2-2: The citation to the 2020 LRDP EIR and other documents does not contain a full complement of all the subsequent environmental documents.

ORG 4.8

Section 3.3: Need for the Project (page 18 of Draft SEIR)

Section 3.5 Program Description (page 19 of the Draft SEIR)

SNC Comment 3.3-1: UCB has failed to document the specific need for 37,000 gross square feet of space for the GSPP. No citation to a strategic plan or other equivalent document is made for the GSPP that would link the Project to the land use and facility needs identified by GSPP prior to the Project. For the 2020 LRDP, UCB clearly linked its development program to a Strategic Academic Plan and New Century Plan (see page 4 of the 2020 LRDP). The analysis presented in Section 3.3 does not provide the current square footage of the GSPP's two existing buildings and does not provide or cite a facility needs assessment or space utilization study that would provide documentation of any deficiencies in the existing two buildings and how these deficiencies would be cured by a proposed 37,000 gross square-foot new facility. Surely for an investment of this magnitude, such studies have been completed². The only specific data provided is the description of 4,500 square feet rented by GSPP at UCB's Memorial Stadium. Without data from a facility needs assessment and/or space utilization study, or due to UCB's intentional withholding from the public such assessments and studies by not citing them in the Draft SEIR, SNC and other members of the public cannot determine the accuracy or reasonableness of UCB's

ORG 4.9

² Table 2 of the Draft SEIR has a reference to Solomon Cordwell Buenz, an architectural firm, but it is unknown what kind of document this firm prepared for UCB. The firm lists the GSPP project as an example of its architectural design work on its website.

conclusion that a 37,000 gross square foot facility is required to house an “additional five staff members” and “30 students on an average, year-round basis relative to existing conditions.”³ In fact, this statement appears inconsistent with another statement on page 18 of the Draft SEIR that the “Upper Hearst Development would help meet these needs by providing housing opportunities as well as **additional building space for the growth of GSPP’s various programs.** [Emphasis added]” SNC believes that UCB is not fully disclosing GSPP’s growth under the Project and that a major expansion of the GSPP is planned without all of its specific impacts having been adequately analyzed. The purpose of this growth does not appear to further the Master Plan for Higher Education but to generate revenue, as indicated in a presentation made by UCB to the UC Board of Regents on March 13, 2019.⁴

SNC Comment 3.3-2: The need for 37,000 gross square feet of office, classroom, and event space is not supported by the information provided by UCB in Table 2 of the Draft SEIR. In Table 2, the uses for academic offices, classrooms, and event space total only 18,190 square feet, leaving almost 19,000 square feet unaccounted for. How do the traffic impact studies treat this excess space? What traffic-generating GSPP program activities are assumed?

SNC Comment 3.3-3: Table 2 indicates that 9,090 square feet of office space is proposed that would house 91 office occupants. Currently, GSPP has 92 faculty and PhD students that would presumably need offices (although many listed as faculty have offices elsewhere on campus). However, the Project appears effectively to permit the move of all GSPP’s offices into the new proposed academic building. If faculty and PhD students are currently housed in the two existing buildings, why is additional space required in the Project? How is UCB planning on using the space freed up in the two existing academic buildings? Have the impacts associated with the back-filling of space been studied? Without a facility needs assessment or space utilization plan with GSPP program growth detailed, how can the need for the Project be documented and/or traffic impact assumptions be confirmed as reasonable and accurate?

SNC Comment 3.3-4: No need for additional classroom space in the amount of 5,960 square feet has been justified or documented in the Draft SEIR. Table 2 indicates that 5,960 square feet of new classroom space would be provided. Assuming a 40-student capacity classroom at 15 square feet per student (from Table 2), this translates into approximately 10 new classrooms. This appears out of scale to the statements made by UCB that program growth by 2023 will be an average of 30 net new students yearly. How is UCB planning on using the classroom space freed up in the two existing academic buildings? Have the impacts associated with the back-filling of classroom space been studied? How does the traffic analysis treat this space?

SNC Comment 3.3-5: No need for event space with a capacity of 450 has been justified or documented in the Draft SEIR. The UCB campus has many spaces for large events and no reason is provided that justifies a new event space in the Project. No data is provided to document that space for GSPP

³ Page 38 of the Draft SEIR.

⁴ See agenda item F7, UC Regents Finance and Capital Strategies Committee, March 13, 2019.

ORG 4.9

activities is routinely unavailable.

SNC Comment 3.3-6: The Draft SEIR is deficient by not clearly showing the relationship between the stated GSPP program expansion and specific assumptions used by UCB in its impact analysis. Page 18 of the Draft SEIR indicates that the GSPP has:

1. Enhanced its Master's of Public Policy program (undefined and not described)
2. Added additional concurrent degree programs (to total six)
3. Substantially augmented its Undergraduate Minor in Public Policy (undefined and not described)
4. Established a Master's of Public Affairs program for mid-career professionals (no program size information provided)
5. Created Executive Education programs that run throughout the year (no program size information provided)

ORG 4.10

For the purposes of analyzing impacts, UCB assumes "additional five staff members" and "30 students on an average, year-round basis relative to existing conditions."⁵ No baseline data of faculty, staff, and student population for GSPP is provided, making it impossible to determine whether the assumption of 5 additional staff members and 30 students on an average, year-round basis relative to existing conditions is reasonable. On its face, the translation of growth into net new population arising from items 1 through 5 above would appear to require a far higher assumption of additional staff and students, resulting in potentially understated impacts in the DRAFT SEIR.

SNC Comment 3.3-6: No information is given to indicate peak periods of facility use that would potentially impact traffic analysis results. For the event space, no information is given regarding the number of events with up to 450 participants and when these events would occur, again, potentially impacting the traffic analysis results. Overall, the formulation of new GSPP population appears to be set to understate traffic impacts. By not providing time of day use data for the event center (including roof-top events), noise impacts on nearby residential neighborhoods cannot be adequately assessed.

ORG 4.11

SNC Comment 3.5-1: UCB needs to accommodate events at locations on campus that are close to public transit, not in a poorly served corner of the campus that will have adverse traffic impacts.

ORG 4.12

SNC Comment 3.5-2: UCB proposes a project that would reach a height of 87' on Hearst Avenue and its plans show an 8-story building that would be completely out of scale with its surroundings!

ORG 4.13

3.6 Planning Context (page 41 of the Draft SEIR)

SNC Comment 3.6-1: The Draft SEIR is deficient by not properly identifying what UCB calls an "updated population baseline" in the Planning Context section of the Draft SEIR as a significant element of the Project. Put in simple terms, the Project consists of a physical expansion of the GSPP, a change in land

ORG 4.14

⁵ Page 38 of the Draft SEIR.

use designation, and an increase of 11,285 students across the campus. UCB's treatment of the increase in student population is inconsistent with how it presented an increase in the student population in the 2020 LRDP and with how it presented this increase in the Notice of Preparation for this Draft SEIR. In the 2020 LRDP, the increase in students was the first element described in the development program (see page 13 of the 2020 LRDP). In this way, the Draft SEIR is not truly tiering to the 2020 LRDP.

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ORG 4.14

SNC Comment 3.6-2: UCB has failed to document the need for an enrollment increase of 11,285 students. On page 44 of the Draft SEIR, UCB states that the “increase in student enrollment results primarily from implementation of the California Master Plan for Higher Education” and that “the growth in college-age Californians has resulted in increased enrollment at all UC Campuses over the past two decades. No analysis is provided that ties actual changes in college aged Californians to the specific increase of 11,285 students proposed by UCB. In Table 1, Appendix A, UCB indicates that the proposed student enrollment by 2021 would be 33.4 percent higher than the 2007 enrollment set forth in the 2020 LRDP. However, according to the California Department of Finance, the total forecasted change in Californians aged 17-18-years will grow by only 3.9 percent by 2021⁶. **The Department of Finance figures suggest that enrollment should only increase by approximately 1,304 students, not 11,285.**

SNC Comment 3.6-3: The growth of college age Californians is not the “primary” reason behind the proposed 11,285 student enrollment increase and UCB errs by saying so. From 2010 to 2018 nonresident students at UCB grew by 8,049, while the absolute number of resident students fell by 291.⁷ We note that the difference between 11,285 and 8,049 would completely accommodate the projected increase based on the Department of Finance figures. We also note that the enrollment growth of 7,778 from 2010 to 2018, is less than the increase in nonresident students. **All of the growth had nothing to do with the growth of college age Californians.** All of UC's enrollment growth, plus another 271 residents replaced by nonresidents, has been nonresident students who, SNC and the California State Auditor note, pay significantly higher fees to UCB. Additional campus population growth is due to an expansion of self-supporting executive education and extension education programs. The primary driver of the enrollment increase appears to be revenue generation for an institution with a widely reported structural deficit.⁸ This finding by SNC is further supported by statements made by UCB to the Board of Regents Finance and Capital Strategies Committee meeting on March 13, 2019, when UCB stated with respect to its graduate and executive education programs is to: “generate significant

ORG 4.15

⁶ Data from State of California, Department of Finance, Table P-1 State Population Projections Total Estimated and Projected Population for California Counties: July 1, 2010 to July 1, 2060 in 1-year Increments; and State of California Department of Finance Race/Ethnic Population with Age and Sex Detail, 2000–2010. Sacramento, California, September 2012.

⁷ 2010 numbers are from California State Auditor, The University of California: Its Admissions and Financial Decisions have Disadvantaged California Resident Students, March 2016 (March 2016 State Auditor report), p.69, Table 15. 2018 numbers are from <https://www.universityofcalifornia.edu/infocenter/fall-enrollment-headcounts>, Berkeley campus, accessed 9 April, 2019.

⁸ See, for example, Berkeleyside article: <https://www.berkeleyside.com/2018/02/26/soul-searching-fundraising-uc-berkeley-slashes-deficit> ; March 2016 State Auditor report

revenue for GSPP and the University.⁹

SNC Comment 3.6-4: Overall, the fact that the growth in UCB student enrollment has been from non-resident students and that UCB desires to accommodate a higher level of enrollment than mandated by the California Master Plan for Higher Education means that the proposed action of increasing UCB student enrollment is a discretionary action undertaken by the Regents.

ORG 4.16

4.0 Relationship to 2020 LRDP (page 43 of the Draft SEIR)

SNC Comment 4.0-1: See SNC Comments 3.6-2 and 3.6-3 regarding the erroneous citation of growth in college-age Californians as the “primary” factor for the proposed student enrollment increase. UCB also cites a UC Board of Regents budget plan that contemplates an enrollment increase of 10,000 undergraduates across all UC campuses – this contradicts UCB’s statement that its proposed 11,285 increase in student enrollment is a necessary action. This information also further suggests that UCB’s proposed increase of student enrollment is discretionary in nature.

ORG 4.17

SNC Comment 4.0-2: On page 45 of the Draft SEIR, UCB states that it is updating the campus population baseline because actual enrollment has exceeded the enrollment limit set in the 2020 LRDP. See SNC Comment 3.6-1. The 11,285 increase in student enrollment should be characterized as part of a project that is best studied separately from the GSPP project as an independent discretionary action.

ORG 4.18

5.0 Environmental Determination (page 48 of the Draft SEIR)

SNC Comment 5.0-1: UCB’s environmental determination is not consistent with the impacts associated with a student enrollment increase of 11,285 and is based upon faulty definitions of the project and the affected environment, faulty data, and faulty findings.

ORG 4.19

6.0 Environmental Evaluation (page 49 of the Draft SEIR)

6.1 Aesthetics (page 50 of the Draft SEIR)

SNC Comment 6.1-1 The Draft SEIR aesthetics section evaluates only the aesthetics impacts on the community and students from construction and operation of the Goldman School from increases in scale, massing, and lighting on recognized scenic resources and on “neighborhood building design compatibility.” There is no evidence that either the 2005 EIR or the Draft SEIR assessed the effect of increases in student enrollment, including past increases that are over and above the increase of 1,650 students projected in the 2005 EIR for the 2020 LRDP and expected future increases, on the surrounding community caused by increases in the number of students living off-campus and the associated increase in visual impacts from improper trash disposal and littering. Therefore, with respect to aesthetics impacts, the Draft SEIR does not deliver on the promise made in the NOP to analyze whether the

ORG 4.20

⁹ See page 2 of agenda item F7, UC Regents Finance and Capital Strategies Committee, March 13, 2019.

increase in current and foreseeable campus population levels above those analyzed in the 2020 LRDP EIR would result in new or substantially more severe significant impacts than identified in the 2020 LRDP EIR. ↑

ORG 4.20

6.2. Air Quality (page 582 of the Draft SEIR)

SNC Comment 6.6-1: *Page 63. Approach to Campus Headcount Baseline Update.* UC limits its evaluation to whether any physical development is required on campus to accommodate the change in campus headcount. However, this approach understates potential impacts associated with the physical development required to accommodate this change in headcount outside the campus, primarily within the City of Berkeley and other nearby communities since no additional housing beyond what was set forth in the 2020 LRDP is proposed in this action. UCB has selected a significance threshold that does not capture the true significance of the impacts.

ORG 4.21

6.7. Greenhouse Gas Emission (page 102 of the Draft SEIR)

SNC Comment 6.7-1: *Page 107.* The Draft SEIR fails to address potential increases in greenhouse gas emissions caused by the greater commuting burdens placed on low-income Berkeley residents who may be displaced by students seeking housing in greater numbers due to the proposed increase in student population.

ORG 4.22

SNC Comment 6.7-2: Greenhouse gas emission reductions cannot be used to ‘offset’ other environmental impacts.

6.9. Hydrology and Water Quality (page 123 of the Draft SEIR)

SNC Comment 6.9-1: *Page 126.* The Draft SEIR fails to address the potential increased burden on the City of Berkeley’s stormwater system. If UCB were to mitigate the adverse impacts on the local housing market by constructing new housing on campus, it would increase the impervious surfaces on campus and increase runoff into the City’s stormwater system. UCB’s analysis is deficient by its definition of the affected environment and selective threshold of significance.

ORG 4.23

6.11. Noise (page 139 of the Draft SEIR)

SNC Comment 6.11-1: *Page 143. Approach to Campus Headcount Baseline Update.* The Draft SEIR noise section evaluates only the noise impacts on the community and students from construction and operation of the Goldman School from construction activities and increases in traffic. However, this approach understates potential noise impacts associated with the proposed increase of 11,285 students (including past increases that are over and above the increase of 1,650 students projected in the 2005 EIR for the 2020 LRDP and expected future increases) who would live primarily off-campus in private housing. ↓

ORG 4.24

Students living off-campus in groups have been found to have adverse, significant impacts on residential neighborhoods with increases in noise, late-night traffic, and improper refuse disposal, leading to special legislation adopted by the Berkeley City Council to address these problems¹⁰. UCB itself has had to institute special programs to mitigate these problems. UCB's analysis does not address how these negative impacts might increase with a significant student population change of 11,285 students.

ORG 4.24

Therefore, with respect to noise impacts, the Draft SEIR does not deliver on the promise made in the NOP to analyze whether the increase in current and foreseeable campus population levels above those analyzed in the 2020 LRDP EIR would result in new or substantially more severe significant impacts than identified in the 2020 LRDP EIR.

6.12. Population and Housing (page 148 of the Draft SEIR)

SNC Comment 6.12-1: *Page 149. Induce substantial population growth in an area, directly or indirectly.* Using the regional Bay Area population as a benchmark for population and housing impacts is not appropriate since the impacts of induced population growth have been and will continue to be focused on the City of Berkeley. UCB itself has defined a Housing Zone (page 134 of the Draft SEIR) as a one-mile radius from Doe Library or a 20-minute commute on public transit. Between 2005 and 2018, the population of Berkeley increased by approximately 9,600 within the Housing Zone (defined in this example by the one-mile radius). Meanwhile, the UCB student population grew by approximately 8,300 students. The growth of students comprises 86.5 percent of the City's population growth, suggesting potential significant population and housing impacts. No additional student housing (other than building 150 units counting towards the 2,300 beds set forth in the 2020 LRDP) is proposed to mitigate impacts associated with the increase in campus population. Overall, the Draft SEIR fails to substantiate its finding that "the proposed increase in campus headcount would generally be accompanied without significant adverse impacts (page 151 of the Draft SEIR)."

ORG 4.25

SNC Comment 6.12-2: The impact of 11,285 new students is potentially significant. Potential impacts on the City of Berkeley and its residential neighborhoods include the following:

¹⁰ In addition, many public hearings on ordinances to restrict and regulate mini dorms, abate nuisance properties, and to toughen up penalties for loud noisy parties were held by the City of Berkeley City Council and Planning Commission between 2010 and 2019. The records of these hearings contain testimony from more than one hundred residents of the area around the campus on the negative impacts of the enormous increase in students living in the campus surroundings in Berkeley. Examples of these hearings include but are not limited to: public hearings related to 2133 Parker Street, including a hearing before the Berkeley City Council on November 15, 2011 and public hearings related to the City Council adoption of Ordinance No. 7,455-N.S. related to the regulation of mini-dorms, including a hearing on July 16, 2013. The findings section of Ordinance No. 7,455 N.S. also includes findings of aesthetic and noise impacts associated with UCB's increase in student enrollment. SNC has itself submitted a series of letters and briefing documents to the Berkeley City Council and Planning Commission outlining the negative impacts associated with UCB's increase in student enrollment and these documents are in the City's public record and publicly available. An EIR must analyze every issue for which the record documents a significant impact. (*Visalia Retail, LP v. City of Visalia* (2018) 20 Cal.App.5th 1, 13 (*Visalia Retail*); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1109 (*Amador Waterways*).

1. Increased pressure on the local housing market with higher rents and more displacement of low- and moderate-income non-student households, accelerating gentrification as documented by UCB's Urban Displacement Project. Census Tracts adjacent and near UCB are at risk of gentrification or are undergoing gentrification.
2. Increased demand for police protection – UC is already one of the nation's most dangerous universities and UC has cut, not increased, its UC Police force.
3. Increased demand for fire and emergency medical services, particularly alcohol related transports of students living unsupervised off campus.
4. Increased demand for parks and open space.
5. More noise in Berkeley's residential neighborhoods with loud parties and late night traffic.
6. Increased incidence and volume of improper refuse disposal and moving-day trash.

SNC also cites a comment letter from Ms. Gale Garcia that documents aesthetic impacts arising from trash on sidewalk and public property from student residences.

ORG4.25

SNC Comment 12-3: Page 151. The Draft SEIR reaches an improper conclusion that “increased headcount would not introduce new sources of noise that may disturb residents, since neighborhoods near UC Berkeley already accommodate a high proportion of off-campus student rentals.” The specific reference to “already accommodates” includes the very students that are included in the change in baseline. **So it is the equivalent of saying: “students over the baseline are already here so there is no impact.” This is illogical in a CEQA analysis context.** In addition, in SNC Comment 6.11-1 we note that both the City of Berkeley and UC have acknowledged the significant impacts resulting from off-campus student rentals. The City of Berkeley had to adopt an ordinance to control the proliferation of mini-dorms occupied primarily by UCB students (July 16, 2013) and both the City of Berkeley and UCB jointly established a law enforcement ‘party patrol’ to enforce the City’s noise ordinances.

8. Alternatives (page 190 of the Draft SEIR)

SNC Comment 8-1: The Alternatives section should include a “Student Housing Only” alternative since such an alternative might generate a positive impact in contrast to the Off-site Lease Agreement, Academic Building Only, or Reduced Scale alternatives.

SNC Comment 8-2: The Alternatives section is deficient since it does not provide alternatives to the proposed student enrollment increase of 11,285 and only narrowly focuses on variations of the GSPP and student housing elements of the Project. The alternative for increased student enrollment at UCB should be one that shifts new students to campuses in the UC system with lower housing costs and adequate land to accommodate student housing such as Merced, Riverside, and Davis.

ORG4.26

Sincerely,

Southside Neighborhood Consortium:

Joan Barnett, President, Dwight-Hillside Neighborhood Association
George Beier, President, Willard Neighborhood Association
Phil Bokovoy, President, Save Berkeley's Neighborhoods
Mike Kelly, Panoramic Hill Association
Dean Metzger, President, Claremont-Elmwood Neighborhood Association
Gianna Ranuzzi, President, Le Conte Neighborhood Association
Andrew Johnson, Bateman Neighborhood Association
Dean Metzger, President, Berkeley Neighborhoods Council
David Shiver, Stuart Street/Willard

plans related to construction replacing Upper Hearst Garage

1 message

Elise MILLS <elisem@berkeley.edu>
To: planning@berkeley.edu

Tue, Feb 26, 2019 at 3:18 PM

Dear Planning team,

I am not against this plan going forward. However, I do have transit, parking, and even safety concerns related to this project.

1. Parking - right now today - I found < 10 open spaces up in Foothill at lunch time (with some spaces filled by USPS truck with no tags, as well as a UCB facilities truck or 2). Since I didn't head there first this am and parked on the street so I wouldn't miss my meeting, I went to move my car mid-day. I am very concerned of what will happen during construction & de-construction when no parking at Upper Hearst will exist. In addition, I highly recommend paving an actual cement/asphalt path from Foothill down along Hearst. People walk along there (including myself) rather than going all the way to the base of the Greek Theatre & climbing numerous sets of stairs to the top. I think safety would be improved if the southside of Hearst/Cyclotron was paved up until you reach the Foothill parking lot.

IND 1.1

I think converting the public parking spaces in lower Hearst is a good idea. Though, already - on a day like today - likely there are no vacant spots - public or otherwise. I think we're already almost tapped out for parking for faculty, staff, & students (not even accounting for visitors) on the northside of campus.

2. Transit - Usually several days a week I find I stay late at the office - 7pm and sometimes later. There is less transit coming by the northside of the campus. BART & 511.org usually recommend that one hike down the hill to BART & use transit from there on. After dark I am not so keen on that option. Though I've never been accosted on the campus, the one time I was robbed while living in the bay area was when I was trying to come back to campus while walking/taking AC Transit after dark to do some work. Also, because Northside is less populated than south & west sides of campus, it is naturally less safe (safety in numbers). Some of us were scared to read that there had been a carjacking via handgun at Hearst and La Loma on February 17 at 7:06PM. That is not very late, & it was right on Hearst - so even the prospect of hanging out waiting at the bus shelter does not sound particularly safe.

IND 1.2

Thanks for giving us an opportunity to give input.
Elise

Elise Mills, CRA RACC
Contract & Grant Manager
ERSO
382 Cory Hall, Berkeley, CA 94720-1774
510-643-6682
email: elisem@berkeley.edu



150
YEARS
OF LIGHT

Upcoming Out of Office Schedule:

A-508



Letter IND 2

Planning Departmental <planning@berkeley.edu>

Construction project replacing Upper Hearst Garage

1 message

Gina Banton <ginam@berkeley.edu>
To: planning@berkeley.edu

Wed, Feb 27, 2019 at 8:08 AM

Hello -

I write to strongly oppose the proposal to replace Upper Hearst Garage. In the 11 years I have been at UC Berkeley demands on staff have increased significantly and our ability to recruit and retain quality staff has diminished. Parking on campus is already challenging and expensive, and taking away a substantial number of spaces as is being proposed would make the staffing challenges we already face far more significant. I understand that one may argue that other parking solutions are being proposed, but as a mother of small children it is not an option for me to park and bus in, because if there's an emergency I need to be able to get to my kids quickly. For me, I will have to consider leaving Cal despite 11 years of service if this plan is approved, as I will not feel comfortable or valued by the employer if parking reasonably near my work space cannot be provided.

IND
2.1

Best regards,
Gina Banton

--

Gina Banton
Human Resources Operations Lead
Sr. HR Business Partner
ERSO
University of California, Berkeley
199MB Cory Hall
Berkeley, CA 94720
510.642.9817



Letter IND 3

Planning Departmental <planning@berkeley.edu>

Solutions?

1 message

James CASEY <jimcasey@berkeley.edu>
To: planning@berkeley.edu

Wed, Feb 27, 2019 at 7:14 PM

The parking lot under discussion is full to capacity every working day. I often have to try several floors before finding a spot (I pay for a C hunting pass). So, the proposed plan will definitely impact getting to class and meetings on time, added to an already high level of daily stress.

One possibility is for the campus to negotiate with Uber and Lyft to develop a reasonably priced regular ride plan. It might be affordable instead of paying the high parking fees.

Sent from my iPhone

Construction project replacing Upper Hearst Garage. Comments invited

1 message

Laura Waller <waller@berkeley.edu>
To: planning@berkeley.edu

Wed, Feb 27, 2019 at 5:27 PM

Hello,

I want to officially oppose the severe reduction in parking spaces in Upper Hearst Garage. Parking on campus (and especially at Upper Hearst, which is convenient for those of us in Cory/Soda/SDH) is already extremely difficult and limiting, and I believe that making it even more limited will have bad consequences. I don't even park there very often, since I was so fed up with campus parking that when I bought a house I chose one in walking distance to Cory hall. But I know not many people can afford to (or want to) do this. I already know that many faculty (and students) arrange their days around parking, either working from home, or coming in late hours to avoid the rush. Or, when I have to park with attendants, I must leave campus early evening, rather than working late. I think the poor parking situation already contributes to a loss of community in EECS and many faculty not being "around" for informal conversations that often lead to productive research outputs.

IND 4.1

A shuttle is not a great solution. If you add 15-30 min each way to the commute, for people with kids, this just cuts their workday by 30-60 min. This is a huge cost to the university and it will be seen in the reduction of quality in teaching/research, which is the core mission of the university!

IND 4.2

Laura

--

Laura Waller
Ted Van Duzer Associate Professor
Department of Electrical Engineering and Computer Sciences
University of California, Berkeley
waller@berkeley.edu
www.laurawaller.com



Letter IND 5

Planning Departmental <planning@berkeley.edu>

Construction project replacing Upper Hearst Garage.

1 message

LOGAN BALDINI <baldini@eecs.berkeley.edu>
To: planning@berkeley.edu

Wed, Feb 27, 2019 at 1:53 PM

Good day,

Please note this is my formal letter of opposition to the changes in the amount of parking spaces due to the construction project at the Upper Hearst Parking lot. There should be **no** negative change in the amount of spaces when construction is completed and there should be 90 more spaces to accommodate the new housing development.

Campus is constantly limiting the number of parking spaces for Staff/Faculty. Most staff commute farther than 20 miles and have limited access to public transportation or time wise it is not an option. The erosion of parking spots at Cal and specifically Upper Hearst puts more strain on staff and creates longer uncompensated transportation time and lowers morale.

The public transportation system in the bay area is poor and is not set up for long commutes. Current salary rates at Cal force staff to live far away limiting alternative transportation options. Removing all of these spots will cause an extra 15-45 min daily of transportation time to staff who already commute an about a hour each way. This will also increase the amount of staff using public street parking who move their cars every 2 hours. This creates a unneeded safety hazard and environment impact as people are constantly in the street and moving their cars around the block.

Lastly these all parking spots are reserved "rented" for game day BBQ tailgating and parking for people/alumni who donate to Cal. There will be a long term negative community and financial impact to the campus as I suspect these Alumni will pull their funding and will not attend games if they don't have anywhere to park.

For the record I rarely drive here but I can see how this will negatively impact EECS and other Cal campus community members.

Respectively,

Thanks !**Urgent Facilities issues please Call or TXT 510-384-8914****For all other items please fill out a [Facilities Ticket here](#)****Logan Baldini**

Building Manager - Cory Hall

Electrical Engineering and Computer Science

University of California, Berkeley

253 Cory Hall, MC 1770 | Berkeley CA 94720

c. 510-384-8914 | t. 510-642-1468 | f. 510-643-7846e. baldini@berkeley.edu | www.eecs.berkeley.eduIND
5.1

Feedback on construction project replacing Upper Hearst Garage

1 message

Lydia Raya <lraya@eecs.berkeley.edu>
To: planning@berkeley.edu

Wed, Feb 27, 2019 at 11:24 AM

Hello,

I am an EECS staff member who works in Soda Hall. I am very concerned about the upcoming project in terms of its impact on parking availability for staff and faculty in the surrounding buildings. I believe this is going to be quite disruptive to work and class schedules.

EECS is the largest department on campus. As such, EECS has a large staff and faculty in order to make the department function properly. While some use public transportation or ride bicycles to work, many of us drive. Many do not have other options due to family responsibilities, commutes, etc. It is my hope that the entire Lower Hearst Garage will be made available to F & C parking permit holders once construction commences and will remain this way going forward. Permits are expensive and the university has a responsibility to provide parking to those who make a financial contribution each month to be able to park. Even if the Lower Hearst Garage was made available to only permit holders, this would not nearly cover all the surrounding departments, but I don't think it's reasonable to ask people to take shuttles from other parking lots. This creates traffic and once again, is disruptive toward schedules for both faculty and staff.

Staff and faculty come to work day in and day out for years. The university should make it a priority to allow them to come to work in a reasonable manner so that we can fulfill our responsibilities toward students and overall.

Thank you,
Lydia

--

STUDENTS, please include your SID

Lydia Raya
Computer Science Advisor
349 Soda Hall
(510)664-4436
Pronouns: she/her/hers

Want to meet with a CS advisor? See options below:

Peer advising: Mon & Tues 12-2PM, Wed 11-1PM & 2-4PM on 3rd floor of Soda by HP Auditorium

CS-intended or LSCS students: book appointments through CalCentral

Prospective students: click [here](#) or [here](#) to book an appointment

Drop-in hours: Wed 10-12PM & 1-4PM in 349 Soda

[Food Pantry and Housing Security Resources](#)
[Undocumented Student Program](#)
[L&S Computer Science FAQ](#)
[Subscribe to the EECS 101 Piazza page](#)
[GBA for Junior Transfers](#)
[GBA for Four-year Students](#)

IND
6.1

Fwd: [meprof] Subject: Construction project replacing Upper Hearst Garage. Comments invited

Reza Alam <reza.alam@berkeley.edu>

Wed, Feb 27, 2019 at 7:19 PM

To: planning@berkeley.edu

Hi,
Parking is already a big problem on campus. I am a professor at Berkeley, and I have missed lectured because of not finding parking: driving from one lot to the other and all are full. If I need to drive to a meeting off campus in the middle of the day, it is a nightmare, because I will certainly not be able to find a parking spot when I return. I am already paying a lot of money for curbside parking because campus parkings are full. Please plan in advance before taking down more of limited parking spots.

IND
7.1

Reza Alam
Associate Professor
Mechanical Engineering
UC Berkeley

----- Forwarded message -----

From: **Roberto HOROWITZ** <horowitz@berkeley.edu>

Date: Wed, Feb 27, 2019 at 6:29 PM

Subject: [meprof] Subject: Construction project replacing Upper Hearst Garage. Comments invited

To: ME-Prof <meprof@me.berkeley.edu>, mestaff me.berkeley.edu <mestaff@me.berkeley.edu>, <meprof-meriti@me.berkeley.edu>, <meprof-pogs@me.berkeley.edu>

Cc: Vicky Garcia <vgarcia@berkeley.edu>

Dear ME faculty and staff:

This email is sent to a very wide distribution. Please consider carefully and use discretion before replying to share your personal views with this entire group.

There is a project underway to replace the upper Hearst garage across the street from Cory Hall. It will expand space for the Goldman School of Public Policy as well as create 150 housing units. It will also dramatically reduce parking availability in our corner of campus. Here are some of the facts regarding parking impact as I understand them

1. Construction is projected to begin in September 2019.
2. There are currently 345 spaces available, this is a combination of garage and flat lot parking on the site, not counting extra attendant facilitated stack parking.
3. During construction there will be no campus parking available in Upper Hearst.
4. Construction is estimated to take 23 months from the start date, based on start dates that I have heard discussed (Sept 2019) that would complete the project in August 2021.
5. At the end of the construction there would be 217 spaces available in the new Upper Hearst garage under the new building.
6. Of these 217 spaces up 90 spaces may be available for the residents of the new housing. The exact number dedicated to residents is still in discussion.
7. Assuming the residents get the maximum number of spots (90) that would mean a loss of 218 permanent spaces.

A-514

8. During construction parking & transportation hopes to buy out any available spaces in the Maxwell Field private lot up near the Stadium; this would allow F & C permit holders the ability to park there during construction.
9. Another proposal under consideration is to convert the lower Hearst public parking spaces to F & C spaces as well.
10. P&T is also talking about possibly running a 15-minute shuttle from the Foothill Lot and the Clark Kerr lots to the Hearst Mining Circle, this would allow faculty and staff to park at these satellite lots without having to walk great distance to their offices.

Even if you do not park in the Upper Hearst lot, this project will make a significant impact on our whole community. This project has a draft supplementary environmental impact report that is currently under review and is available for comment. The notice regarding this report including a link where you can read it for yourself is copied below. All are encouraged to submit formal comments, whether in favor, in opposition, or otherwise to the Campus Planning Office. The email address to send comments to is: planning@berkeley.edu

All such comments will become public records.

Thanks for your attention to this important matter.

Sincerely,
Roberto

Roberto Horowitz
Professor and Chair, Department of Mechanical Engineering
James Fife Endowed Chair
6143 Etcheverry Hall
University of California, Berkeley CA 94720-1740

Ph: (510) 643-7013, Fax: (510) 642-6163; horowitz@berkeley.edu
www.me.berkeley.edu/faculty/horowitz/

For Mechanical Engineering Department matters please contact:
Ms. Melissa Varian
Phone: (510) 644-5400
E-mail: m_varian@me.berkeley.edu

To All Interested Parties:

Notice is hereby given that the University of California, Berkeley, as Lead Agency under the California Environmental Quality Act (CEQA), has completed a Draft Supplemental Environmental Impact Report (Draft SEIR) for the Upper Hearst Development for the Goldman School of Public Policy, tiered from its 2020 Long Range Development Plan EIR. The Draft SEIR evaluates potential environmental impacts associated with the proposed development of two buildings located at the corner of La Loma Avenue and Hearst Avenue.

UC Berkeley invites comments on the Draft SEIR, which will be circulated for a 45-day review period, extending from February 20, 2019, to April 8, 2019. **Written responses to the Draft SEIR must be received by 5:00 PM on Monday, April 8, 2019.** Additionally, a public hearing to receive oral comments will be held on the UC Berkeley campus the evening of Tuesday March 12, 2019. The public hearing will be held from 6:30 PM to 8:00 PM at Alumni House, adjacent to Spieker Plaza on the UC Berkeley campus.

Links to electronic versions of the [Notice of Availability](#) and the [Draft SEIR](#) are available on-line on the UC Berkeley Capital Strategies website at: <https://capitalstrategies.berkeley.edu/resources-notices/public-notices>

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Physical and Environmental Planning

300 A&E Building

UC Berkeley

3/5/2019

UC Berkeley Mail - Fwd: [meprof] Subject: Construction project replacing Upper Hearst Garage. Comments invited

website: capitalstrategies.berkeley.edu

phone: (510) 643-4793

email: planning@berkeley.edu

--

You received this message because you are subscribed to the Google Groups "ME Prof" group.
To post to this group, send email to meprof@me.berkeley.edu.



Letter IND 8

Planning Departmental <planning@berkeley.edu>

RE: Construction project replacing Upper Hearst Garage

1 message

Sharon Norris <sharon_n@berkeley.edu>
To: planning@berkeley.edu

Wed, Feb 27, 2019 at 1:08 PM

Good morning -

Staff are the most vulnerable members of the campus community because they are the least valued, and have the least flexibility during the work day and work week. Faculty and students can make their own schedules and work remotely as often as they desire. Full-time staff (in most positions) are required to be on campus a MINIMUM of 9 hours a day. Start of business (8:00AM) until close (5:00PM). The only "flexibility" is a choice between 8:30AM-5:30PM or 9:00-6:00PM.

IND
8.1

A closure like this will have a negative impact on hundreds of employees and their families in the sense that it will add another 40-60 minutes (round-trip) to each work day to accommodate the farther distance and waiting on the shuttle to show up and transport them up and down the hill.

Smaller and more frequent shuttles should be offered from the North and East sides of campus (like the ones offered by the National Lab) that transport people from North Berkeley BART and the Richmond Field Station.

Put a big parking lot out near Richmond Field station area, let commuters from Richmond, Vallejo, Marin, etc. park there and take a shuttle the rest of the way in.

Maybe set up several Park and Ride Lots a few miles on the North, South and East sides of campus that community members can drive to, park their car (or bike) and catch a shuttle back and forth to campus.

Thank you for taking our comments.

Best regards,

Sharon Norris
Office: 510-809-8674
E-mail: sharon_n@berkeley.edu

Fwd: [meprof] Subject: Construction project replacing Upper Hearst Garage. Comments invited

Tony M KEAVENY <tonykeaveny@berkeley.edu>

Wed, Feb 27, 2019 at 9:08 PM

To: planning@berkeley.edu

Cc: Roberto Horowitz <horowitz@berkeley.edu>, Vicky Garcia <vgarcia@berkeley.edu>

I would like to highlight potential problems with the parking situation during construction, which is estimated to last for about two years.

The solutions being presented below for the construction period are vague in terms of the numbers and suggest that appropriate plans are not in place. For this period of construction, I'd like to see an analysis of numbers of parking spaces, numbers of faculty with permits, and some evidence presented that the University actually has sufficient number of parking spaces available with respect to the number of monthly permits issued to faculty and staff.

IND
9.1

Also, some solutions proposed during the construction period seem to place undue burden on the faculty and staff, and is wasteful in terms of our human resource utility. For example, one suggested solution is to require a potentially time-consuming "commute" from other parts of campus (Clark Kerr to Hearst?!) Think of the lost productivity associated with that: instead of being at work at your office, you are commuting to and from your office to your distant parking spot — and this is after you spend a good 10-15 minutes scouting through lower hearst or west campus or wherever to try to get a spot before proceeding to the distant location. In these times of budget constraints, the last thing we need is to further stress the faculty and staff and to waste our human capital like this.

IND
9.2

Tony M. Keaveny, Ph.D.

Professor, Departments of Mechanical Engineering and Bioengineering;
Co-Director, Berkeley BioMechanics Laboratory

5124 Etcheverry Hall, MC 1740
University of California
Berkeley, CA 94720-1740

Mobile Phone: (510) 390-1626
tonykeaveny@berkeley.edu
<https://www.me.berkeley.edu/people/faculty/tony-m-keaveny>

Office Hours:
Tue, Thur 1:30–3:00 pm

If you received this message in error, please delete it immediately. This message may contain information that is privileged, confidential and exempt from disclosure and dissemination under applicable law.

On Feb 27, 2019, at 7:34 PM, Alice M. AGOGINO <agogino@berkeley.edu> wrote:

Dale, this is going to put more pressure on parking for people associated with Berkeley.

Alice Merner Agogino

Roscoe and Elizabeth Hughes Professor of Mechanical Engineering

Product Design Concentration Founder and Head Advisor, MEng Program

Chair, Development Engineering Graduate Group

3/5/2019

UC Berkeley Mail - Fwd: [meprof] Subject: Construction project replacing Upper Hearst Garage. Comments invited
Education Director, Blum Center for Developing Economies

Office: Blum Center for Developing Economies

Blum Hall 200E

<http://www.berkeley.edu/map/?blum>

510-666-3704 (office phone)

510-643-5316 (receptionist)

University of California at Berkeley

Berkeley, CA 94720

<http://www.me.berkeley.edu/faculty/agogino/>

agogino@berkeley.edu

Twitter: <http://twitter.com/agogino>

[Quoted text hidden]



Letter IND 10

Planning Departmental <planning@berkeley.edu>

People's Park Student Housing

david lerman <415justice@att.net>

Sun, Mar 3, 2019 at 9:51 PM

Reply-To: david lerman <415justice@att.net>

To: "planning@berkeley.edu" <planning@berkeley.edu>

Dear UC-B:

It is critically important that UC-B develop as much student housing as possible on all sites, including the plot of land currently known as "People's Park."

There is not enough housing for students attending CAL, and building quality housing near campus is an urgent need to keep students from living on the streets, in parks, or in cars.

It would be a dangerous mistake to include homeless housing at the site. The entire site should be restricted only to CAL students and staff, and their authorized visitors. Students need safe living spaces that do not allow public access. Opening the site to members of the public would be a threat to the safety of students and staff.

Residents of Berkeley want to see student housing built at People's Park ASAP. This property has been the center of criminal activity, including assaults, robberies, and drug dealing, for far too long. The entire site needs to be developed in a way that will serve the mission of UC-B as quickly as possible.

I want to see students living in clean, safe, new housing at this location near campus.

The vast majority of the public supports the student housing project at the site currently known as "People's Park." This is university property and it should be used to help students.

Please note that I was alerted to your solicitation of public comments by the following article:

[Urgent Notice Re People's Park SEIR. Category: Extra from The Berkeley Daily Planet](#)

IND
10.1

Urgent Notice Re People's Park SEIR. Category: Extra from The Berkeley D...

Berkeley Daily Planet, Berkeley California

A-520

The East Bay's Non-commercial Voice

Best regards,

David Lerman



Letter IND 11

Planning Departmental <planning@berkeley.edu>

EIR comment on People's Park

1 message

Carol Denney <cddenney@igc.org>
To: planning@berkeley.edu

Wed, Mar 6, 2019 at 10:39 AM

Comments on Supplemental Environmental Impact Report (SEIR) for their Long Range Development Plan (LRDP) from Carol Denney

To Whom It May Concern,

Re: Comments on Supplemental Environmental Impact Report (SEIR) for Long Range Development Plan (LRDP)

I am a former student of the university who does not oppose the university building housing, but who opposes building housing on People's Park, a city landmark on the state's roster of landmarks now in its 50th anniversary year, an international symbol of user development, free speech, and opposition to war.

The University of California, my alma mater, stated at the outset of its plan to build additional housing that it had nine sites to choose from for housing projects, all of which left the main campus property undisturbed. The main effect this has is to force more and more of the town to service the university's housing needs, compounding a housing crisis courting the lead nationwide for high prices and per capita homelessness.

The university's own "Long Range Development Plan" shows it has currently between 8,000 and 10,000 more students enrolled than it agreed to enroll in legally binding agreements with the City of Berkeley and its impacted neighborhoods. It's "Housing Master Plan" states plainly that even its long-term goals only provide for "two years of university housing for entering freshmen," and "one year of university housing for entering transfers" and "one year of university housing for graduate students" making certain that students will shortly, in the middle of their studies, face the housing shortage head-on.

The nine sites cited as available *neglected* to include vast open spaces on the main campus, which it clearly does not want to disturb in favor of destroying local landmarks. It also neglected to include empty, run-down and what seems to be deliberately neglected housing on the Smyth Fernwald tract near the main campus which once accommodated 74 families, a location with still operative dining room facilities.

Nor did the list of available sites include the convenient Clark-Kerr Campus now housing 900 students with additional senior housing in buildings which are low-rise, and many of which are single story. The Clark-Kerr Campus has many neglected, run-down buildings and vast open space which the university is currently using to build *sand pit volleyball courts*, of all things, over neighbor' objections and in violation of legal agreements with neighborhood groups.

People's Park is still governed by agreements signed in 1978 and 1979 to maintain the land as "educational and recreational" space, agreements which include including neighborhood and park user groups which have been shut entirely out of this discussion. I am not only in our community in being terrified of having to endure more conflict over People's Park which in the not so recent past cost millions of public dollars as well as disrupting and costing lives. Please consider the many locations currently available for additional housing, and respect People's Park's landmark status and international renown.

Sincerely,

Carol Denney

1970 San Pablo #4, Berkeley, CA 94702

#



Comments on Supplemental Environmental Impact Report.docx

12K

IND
11.1

Comments on Supplemental Environmental Impact Report (SEIR) for their Long Range Development Plan (LRDP) from Carol Denney

To Whom It May Concern,

Re: Comments on Supplemental Environmental Impact Report (SEIR) for Long Range Development Plan (LRDP)

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The University of California, my alma mater, stated at the outset of its plan to build additional housing that it had nine sites to choose from for housing projects, all of which left the main campus property undisturbed. The main effect this has is to force more and more of the town to service the university's housing needs, compounding a housing crisis courting the lead nationwide for high prices and per capita homelessness.

The university's own "Long Range Development Plan" shows it has currently between 8,000 and 10,000 more students enrolled than it agreed to enroll in legally binding agreements with the City of Berkeley and its impacted neighborhoods. It's "Housing Master Plan" states plainly that even its long-term goals only provide for "two years of university housing for entering freshmen," and "one year of university housing for entering transfers" and "one year of university housing for graduate students" making certain that students will shortly, in the middle of their studies, face the housing shortage head-on.

The nine sites cited as available *neglected* to include vast open spaces on the main campus, which it clearly does not want to disturb in favor of destroying local landmarks. It also neglected to include empty, run-down and what seems to be deliberately neglected housing on the Smyth Fernwald tract near the main campus which once accommodated 74 families, a location with still operative dining room facilities.

Nor did the list of available sites include the convenient Clark-Kerr Campus now housing 900 students with additional senior housing in buildings which are low-rise, and many of which are single story. The Clark-Kerr Campus has many neglected, run-down buildings and vast open space which the university is currently using to build *sand pit volleyball courts*, of all things, over neighbor' objections and in violation of legal agreements with neighborhood groups.

People's Park is still governed by agreements signed in 1978 and 1979 to maintain the land as "educational and recreational" space, agreements which include including neighborhood and park user groups which have been shut entirely out of this discussion. I am not only in our community in being terrified of having to endure more conflict over People's Park which in the not so recent past cost millions of public dollars as well as disrupting and costing lives. Please consider the many locations currently available for additional housing, and respect People's Park's landmark status and international renown.

Sincerely,

Carol Denney

1970 San Pablo #4, Berkeley, CA 94702

Re: proposed elimination of new gas hook-ups in Berkeley1 message

bruce bagnell <bagnell.bruce.a@gmail.com>
To: planning@berkeley.edu

Fri, Mar 8, 2019 at 12:08 PM

I am in favor of it.

Several years ago I built in Oakland for my daughter and used split unit heat pumps instead of gas heat, coupled with solar on the roof. Works well.

I do think we need to look for tech improvements which move heat pumps to neutral chemicals such as CO2 instead of R410a and similar.

Thanks

IND
12.1

--

Bruce Bagnell, author of The Self Evolution Spa, a full-length poetry collection.

<https://poemsbrucebagnell.blogspot.com>, order book at: https://www.amazon.com/dp/0998709654?m=A2RT9I54Y3FSKA&ref_=v_sp_widget_detail_pagePoetry Express Berkeley cohost poetryexpressberkeley.comMember of BehomeBerkeley (working for BUSD educator housing) at www.bhomeberkeley.combruceb@bhomeberkeley.com

c.925.457.6475

Haiku:

Addicting packages

arriving daily via Amazon –

one-click mistakes.

-bruce



Letter IND 13

Planning Departmental <planning@berkeley.edu>

Upper Hearst Project

1 message

Derek Sagehorn <sagehoe@gmail.com>
To: planning@berkeley.edu

Fri, Mar 8, 2019 at 10:20 AM

Hello,

I am writing to express my support for the SEIR for the Upper Hearst Project. As a undergraduate student of the University of California, I struggled with housing costs and eventually started commuting from Oakland to attend classes. Since 2011, housing costs in Berkeley have only gotten worse. The Upper Hearst Project is essential for housing Cal students. My only quibble is that it should be denser and taller to accommodate more students in this fantastic location.

IND
13.1

Sincerely,

--
Derek Sagehorn
(925) 783-1963
sagehoe@gmail.com



Letter IND 14

Planning Departmental <planning@berkeley.edu>

make upper hearst housing taller please

1 message

Tommaso Sciortino <sciortino@gmail.com>
To: planning@berkeley.edu

Fri, Mar 8, 2019 at 3:16 PM

I'm a long time resident who lived just a block from here when I was a student. We desperately need as much housing as we can here especially for students, especially so close to campus. This is the perfect place for dense walkable housing. It should be at least 6 or 7 stories tall.

IND
14.1

Tommaso Sciortino
Southside



Letter IND 15

Planning Departmental <planning@berkeley.edu>

Upper Hearst housing should be taller

1 message

Alfred Twu <firstcultural@gmail.com>
To: planning@berkeley.edu

Sat, Mar 9, 2019 at 9:56 AM

Hi UC Berkeley

Regarding the draft supplemental EIR for the student housing at Upper Hearst: now that the design doesn't reuse the existing garage structure, the student housing should be taller (maybe 8 floors similar to Blackwell Hall). We have a severe student housing shortage and should make the most of each site.

IND
15.1

Thanks
Alfred Twu
Berkeley resident and UCB class of 2006



Letter IND 16

Planning Departmental <planning@berkeley.edu>

Upper Hearst Parking

Alper ATAMTURK <atamturk@berkeley.edu>

Mon, Mar 11, 2019 at 5:45 PM

To: planning@berkeley.edu

Cc: "Z. Max Shen" <shen@ieor.berkeley.edu>, Arpad HORVATH <horvath@berkeley.edu>

I am deeply troubled by the planned demolition of the Upper Hearst Parking Structure and elimination of 300+ parking spots with no feedback from the faculty/staff/students using the parking structure on a regular basis. The university must provide additional parking space for the planned housing units, not eliminate the existing ones. Many of us have small kids who need shuttling to/from schools, aftercare, etc. with a car every day. Shuttles and e-scooters won't work!

IND
16.1

This is poor planning that will likely to lead employees avoiding the campus as much as possible.

Sincerely,

--

Alper Atamturk

<https://atamturk.ieor.berkeley.edu/>



Letter IND 17

Planning Departmental <planning@berkeley.edu>

Upper Hearst Draft SEIR - public comment

1 message

Andrew Baker <bakercase@me.com>
To: planning@berkeley.edu

Mon, Mar 11, 2019 at 11:20 AM

I write to urge the University to reconsider the exterior design for the proposed academic/residential building at the corner of Hearst and La Loma.

In replacing the parking garage and parking lot currently located at this site, the University has an opportunity to replace a structure totally out of keeping with the history of the area and the other structures - both historic and contemporary - in the area. But the current design would instead replace one eyesore with another.

The slick materials and curved walls, in particular, show no sympathy for this architecturally important neighborhood. In contrast, the dormitories on La Loma directly across the street from this site - relatively recently constructed - reflect a thoughtful design that while contemporary harmonizes with important historic neighboring buildings, buildings whose designs are still cherished a century after being constructed.

UC can do better than this current design. Carpe diem, and demand a design that will be admired 100 years from now!

IND
17.1



Letter IND 18

Planning Departmental <planning@berkeley.edu>

Upper Hearst Development

1 message

Ann May <annmay@lmi.net>
To: planning@berkeley.edu

Mon, Mar 11, 2019 at 8:22 AM

As a longterm North Berkeley resident I hate to see more ugly, oversized buildings detract from the scenery and what remains of Cal's Beauty. | **IND**
The Reduced Scale Alternative is a good compromise. | **18.1**
Ann May and Rodney Freeland, 1277 Spruce Street.

Parking problems associated with the new GSPP/housing project

Dorit S. HOCHBAUM <dhochbaum@berkeley.edu>

Mon, Mar 11, 2019 at 2:01 PM

Reply-To: hochbaum@ieor.berkeley.edu

To: planning@berkeley.edu

I am writing concerning the new GSPP/housing project and the associated elimination of 300 parking slots in upper Hearst. This is going to be associated with substantial extra burden and waste of time for COE faculty and staff currently using the Upper Hearst structure.

IND
19.1

This is to record my request to construct a new parking structure in the Upper Hearst area so as not to cause difficulties in access COE buildings.

Thanks for considering my request,
Dorit Hochbaum

Professor Dorit S. Hochbaum
Department of IE&OR
Etcheverry Hall,
University of California,
Berkeley Ca. 94720-1777

tel: (510)-642-4998
fax: (510)-642-1403
email: hochbaum@ieor.berkeley.edu
<http://ieor.berkeley.edu/~hochbaum>



Letter IND 20

Planning Departmental <planning@berkeley.edu>

Parking

1 message

James W. RECTOR <jwrector@berkeley.edu>
To: planning@berkeley.edu

Mon, Mar 11, 2019 at 1:27 PM

I can't believe the removal of the Hearst parking structure is being done with no real alternative plans. | IND 20.1

It will severely hurt many .



Letter IND 21

Planning Departmental <planning@berkeley.edu>

Parking problems associated with the new GSPP/housing project

Jonathan Bray <jonbray@berkeley.edu>
To: planning@berkeley.edu
Cc: Arpad Horvath <horvath@ce.berkeley.edu>

Mon, Mar 11, 2019 at 1:31 PM

Dear Sir or Madam:

With the Upper Hearst Parking Structure slated to be demolished starting around October 2019, 300 parking spots will be permanently lost on the Engineering corner of campus. These parking spots need to be replaced. Loss of these spaces will severely impact the productivity of faculty and staff of the College of Engineering. We require a new parking structure for the College of Engineering.

IND
21.1

Thank you.

Jonathan Bray, PhD, PE, NAE
Professor, Dept. of CEE



Letter IND 22

Planning Departmental <planning@berkeley.edu>

Goldman School project

Keith McAleer <kmcaleer@berkeley.edu>

Mon, Mar 11, 2019 at 1:57 PM

To: planning@berkeley.edu

Hi,

It's already very difficult to park on the northside of campus.. losing 300 parking spots will make it even more difficult. Spillover to Lower Hearst is not going to cut it as that lot is already very full and uses valet half the time to accommodate current demand.

It's also geographically difficult spot to get to as parking elsewhere might require walking up Hearst or another hill. Please consider building a structure for CoE staff/faculty/students with this project.

Best,
Keith

--

Keith McAleer
Communications Director, Industrial Engineering & Operations Research
Chief Marketing Officer, Sutardja Center for Entrepreneurship & Technology
UC Berkeley
4141 Etcheverry Hall
(510) 642-6222



[website](#) | [Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn Alumni Group](#)



[website](#) | [Facebook](#) | [Twitter](#) | [Instagram](#)

IND
22.1



Letter IND 23

Planning Departmental <planning@berkeley.edu>

Upper Hearst Parking Structure

M.J. DeJong <dejong@berkeley.edu>
To: planning@berkeley.edu

Mon, Mar 11, 2019 at 1:54 PM

Dear Planning,

I understand that the Upper Hearst Parking Structure is slated to be demolished starting around October 2019, and that about 390 cars now park there. I also understand that only about 90 of these parking spaces will be replaced in the long term.

This is a serious concern. I, actually, rarely use the parking garage at the moment. However, I am still very concerned. Right now, many colleagues across the entire college of engineering opt to work off campus because commuting is such a hassle. If parking becomes difficult and further away (extending commute times), people will work away from campus more, and this will degrade the working environment, decreasing interaction between colleagues.

In general, I am in favor of public transport above more parking, but if the parking were decreased significantly we would need serious investment in public transport infrastructure for the campus if we don't want this to have an effect on the working environment in the college of engineering.

Kind regards,

Prof Matthew DeJong

Department of Civil & Environmental Engineering

University of California, Berkeley

dejong@berkeley.edu

IND
23.1

GSPP project - EIR and impact on parking in the northeast quadrant of the Campus

Nicholas SITAR <sitar@berkeley.edu>

Mon, Mar 11, 2019 at 1:55 PM

To: planning@berkeley.edu, Tsu-Jae Liu <tking@eecs.berkeley.edu>

Cc: Arpad Horvath <horvath@ce.berkeley.edu>, Scott Shackleton <scotts@berkeley.edu>

To: Campus Planning

I am writing to specifically object to the EIR characterization of the proposed elimination of 200+ parking spaces as being carbon saving. That is a complete fiction, as the people who park there are faculty and staff who need flexible access to campus, their offices and, most importantly, to their families. With increasing price of housing in the traditional housing areas in North Berkeley, Berkeley and Oakland, staff and new faculty are forced to move farther and farther into Contra Costa county. Many of those areas are poorly serviced by public transportation, BART extension notwithstanding. For example, my commute of 12 miles over the Berkeley Hills takes 20-25 minutes by car and 1 hour and 15 minutes by public transportation during the rush hour when BART trains are frequent and more than 1 hour and 30-45 minutes outside of those times; clearly an unworkable option. This option becomes completely out of questions for parents who may need to access their children in cases when school or the child care provider summons them as many of us have experienced, especially with 2 working parents.

So, for the Campus and the EIR to pretend that the elimination of 200+ parking spots in the most convenient location to the northeast quadrant of the Campus will decrease traffic and lead to carbon emission reduction is complete fiction. Rather, what we have seen already is a proliferation of Lyft and Uber cars clogging the streets around Campus, which completely defeats any move toward either carbon emission reduction or increasing reliance on alternative means of transportation, which frankly do not exist.

Moreover, we will have 300+ employees, staff and faculty, hunting for parking spaces that have been consistently eliminated around the Campus, being faced with increased commute times, and have generally unpleasant commute to Campus. While the faculty are relatively privileged in this context, the lack of consideration or rather than the completely empty lip service on the viability of other options for staff is high handed and unbecoming of the Campus administration. Ultimately, affected populations will have to decide if the Campus jobs are worth the aggravation and the cost to Campus in terms of losing experienced staff may far outweigh the benefit of the project, as proposed. In that context, putting a new building into the footprint of the existing surface parking lot without eliminating the main parking structure is a much less intrusive and much more friendly option that minimizes the negative impacts and has actual beneficial outcome.

Sincerely,
Nick Sitar

--
Nicholas Sitar
Edward G. Cahill and John R. Cahill Professor
Civil and Environmental Engineering
449 Davis Hall
UC Berkeley
Berkeley, CA 94720
sitar@berkeley.edu

IND
24.1



Letter IND 25

Planning Departmental <planning@berkeley.edu>

Dont u dare touch people's park

Norah Foster <norahfoster98@yahoo.com>

Mon, Mar 11, 2019 at 2:41 PM

Reply-To: "norahfoster98@yahoo.com" <norahfoster98@yahoo.com>

To: "planning@berkeley.edu" <planning@berkeley.edu>

Too sacred

[Sent from Yahoo Mail on Android](#)



Letter IND 26

Planning Departmental <planning@berkeley.edu>

Upper Hearst Parking Structure

Paulo J.M. MONTEIRO <monteiro@berkeley.edu>

Mon, Mar 11, 2019 at 2:23 PM

To: planning@berkeley.edu

I was just informed that Upper Hearst Parking Structure is slated to be demolished starting around October 2019 so 345 parking slots will be lost. This will be extremely disruptive for the College of Engineering because there is no other practical solution (Lower Hearst Parking will be full in no time).

There is little public transportation from my house to campus so I need to drive everyday and now I'll have nowhere to park. Therefore I urge your office to reconsider the demolition of Upper Hearst Parking until a realistic option is found.

Thank you,

Paulo Monteiro

IND
26.1

Paulo Monteiro

Roy W. Carlson Distinguished Professor

Department of Civil and Environmental Engineering

UC Berkeley



Letter IND 27

Planning Departmental <planning@berkeley.edu>

Hearst Parking Structure

Rhonda Righter <rrighter@ieor.berkeley.edu>
To: planning@berkeley.edu

Mon, Mar 11, 2019 at 3:20 PM

Hi,

I know I'm in the minority, but I'm all for building more housing there, even if it means the loss of parking. | IND 27.1

Rhonda Righter



Letter IND 28

Planning Departmental <planning@berkeley.edu>

comment re:closing of upper Hearst parking lot

Susan Kellogg-Smith <susankellogg-smith@berkeley.edu>

Mon, Mar 11, 2019 at 3:17 PM

To: planning@berkeley.edu

Regarding the impact of closing the upper Hearst parking lot. Since I'm not able to attend the public hearing March 12, this is my comment about how it will impact my work schedule.

I'm a staff member with an F parking permit who has worked at UC Berkeley since 1989. I park in the upper or lower Hearst Parking lots daily. I need my car to pickup my adult developmentally disabled child at the end of her day care program M-F. When F permit parking is more limited, on days when I can't park in a lot close to my office in Sutardja Dai Hall, I will have to reduce my work schedule by .5 hour daily (2.5hr/week) to allow time to retrieve my car from a remote lot.

IND
28.1

--

Susan Kellogg-Smith, Buyer
NanoLab Procurement & Accounts Payable
UC Berkeley NanoLab
520 Sutardja Dai Hall
Berkeley CA 94720-1754
e-mail susankellogg-smith@berkeley.edu
Tel: 510-809-8610
Fax: 510-809-8699
<http://nanolab.berkeley.edu>



Letter IND 29

Planning Departmental <planning@berkeley.edu>

yes to parking alternatives

Tina Katopodes Chow <tinakc@berkeley.edu>

Mon, Mar 11, 2019 at 10:46 PM

To: planning@berkeley.edu

It would be great to have more people commuting to campus by bike/bus/train instead of by car. I heard there is a plan to remove 300 parking spots due to the Upper Hearst tear down. For faculty who drive to campus, the thought of campus parking spaces being eliminated sounds crazy. But for the sake of reducing the campus carbon footprint and more, far fewer people should be driving to campus. It therefore seems to be a good thing to do, but can you at the same time please provide better support and incentives for people to commute by e-bike or public transit etc? For example greater subsidy on BART or buses. (Stanford provides FREE Caltrain passes, for example. Having FREE passes for BART would change a lot!)

IND
29.1

Thanks,

Tina

--

~~~~~  
Fotini Katopodes Chow  
Professor  
621 Davis Hall  
Dept. of Civil and Environmental Engineering, MC 1710  
University of California, Berkeley  
Berkeley, CA 94720-1710  
Tel: (510) 643-4405  
Fax: (510) 643-5264  
[tinakc@berkeley.edu](mailto:tinakc@berkeley.edu)  
<http://faculty.ce.berkeley.edu/chow/>  
~~~~~



Letter IND 30

Planning Departmental <planning@berkeley.edu>

Re removal of parking for Davis Hall

Alex Horne <anywaters@comcast.net>

Tue, Mar 12, 2019 at 3:10 PM

To: planning@berkeley.edu

Cc: horvath@ce.berkeley.edu

Planning Committee: I have just heard about the idea to prevent convenient parking by the faculty and staff who use the Upper Hearst Parking Structure near Davis and other Halls. **This is just about the daftest idea since the City Council at Berkeley proposed to ban any auto travel to the UCB campus.** The proposed alternatives of shuttles and the like are beloved of young planning staff everywhere but they are almost always inconvenient and waste valuable faculty and staff time. It takes about an hour a day more (counting both directions) to shuttle or walk from any bus, BART, alternative parking structure to the Davis Hall area. Really, it does. I lived in London for several years with its fine public transit system but nothing beats a car, especially a Tesla. The Davis Hall area is uphill from most transit, not all faculty are 25 years old like planners, they will probably be carrying a load of homework or papers, it may be raining or hot and there are no showers at the NW of campus. If I was a good young faculty member I would think seriously about moving to a more friendly campus. I know you need to create more student housing but please try and find a win-win solution rather than hitting on the faculty and staff in Engineering, and Math, Computer sciences. Please!

IND
30.1

Alex Horne, Professor Emeritus CEE (1971-2003).



Letter IND 31

Planning Departmental <planning@berkeley.edu>

New GSPP project

Arpad HORVATH <horvath@ce.berkeley.edu>

Tue, Mar 12, 2019 at 3:56 PM

Reply-To: horvath@ce.berkeley.edu

To: Planning Departmental <planning@berkeley.edu>

To Campus Planning:

It is planned that a housing unit would replace the Upper Hearst Parking Structure. It is a bad idea. Campus, especially this side of campus, **needs more parking, not less!** Faculty, staff, and students are forced to live further and further away from campus because of Berkeley housing prices, and many are forced to commute by car. Eliminating 300 convenient spots near the College of Engineering is the worst idea!

IND
31.1

We do need to build more housing units for the campus, but they can conveniently be placed a couple of blocks away from campus. Parking is an essential service to campus and needs to be in a central location.

Respectfully,

Arpad Horvath
Professor of Civil and Environmental Engineering
UC Berkeley



Letter IND 32

Planning Departmental <planning@berkeley.edu>

Hearst parking garage

Charlotte JONES <charlotte_jones@berkeley.edu>

Tue, Mar 12, 2019 at 10:06 AM

To: planning@berkeley.edu

Dear Raphael Breines, Senior Planner,

Is there a way that another level of garage can be added, taking away our parking spaces which is already full by 9:00 am, is such a burden on staff and to have to park a mile away from work is not safe with the way our society is these days .

IND 32.1

It's already bad enough we have no security and you rarely see the UCB Police offers, they use to ride their bikes around - also, if you work late and you take public transportation and have to walk to BART it's already not safe, this is making everything worst for the staff.

PLEASE KEEP US LOYAL STAFF PEOPLE SAFE AROUND OUR CAMPUS.

--

Thank you,

Charlotte

Ms. Charlotte Jones
Research Support Assistant
University of CA Berkeley
Engineering Research Support Organization
Berkeley, CA 94720
510-664-4203



Letter IND 33

Planning Departmental <planning@berkeley.edu>

Upper Hearst Development

Edward Hester <edhester@berkeley.edu>

Tue, Mar 12, 2019 at 2:39 PM

To: planning@berkeley.edu

It seems to me that the Goldman school lot is large enough to fit a much larger building without needing to affect the parking structure at all. The Hearst parking lot that is essential to staff and faculty on the N-E corner of campus is already not adequate as to the number of spots needed for this area. Even with stacked attendant parking it is near impossible to find a spot if you arrive after 9:00AM. Adding 150 private apartment units to an already crowded area, and removing over 300 parking spots for staff and faculty seems rather foolish and short-sighted. Please reconsider this decision.

IND
33.1

Edward Hester

R&D Engineer 3

Marvell NanoLab



Letter IND 34

Planning Departmental <planning@berkeley.edu>

Upper Hearst lot

John STEEL <coremodel@berkeley.edu>

Tue, Mar 12, 2019 at 7:10 PM

To: planning@berkeley.edu

Dear Campus Planning,

This is to register my objection to the plan to temporarily eliminate, and permanently reduce, the campus parking available at the Upper Hearst lot.

IND 34.1

Sincerely,
John Steel
Professor of Mathematics



Letter IND 35

Planning Departmental <planning@berkeley.edu>

COE parking issues

Julia Konopasek <konopasek@berkeley.edu>

Tue, Mar 12, 2019 at 12:04 PM

To: planning@berkeley.edu

To Whom It May Concern,

I hear that the upper Hearst Parking lot, which primarily serves the COE community will be torn down--with no plans to replace the 300+ parking spaces that will be destroyed.

I certainly don't know all the issues involved in a situation like this, but the impact of losing a parking structure feels immense. Like most staff and faculty that I personally associate with, I commute to work; I can't ride a bike or walk here. Already my day is 9 hours of work plus 2 more for commuting (on a day without traffic accidents or weather issues). If I have to park far away from the COE and walk (or scooter or shuttle) to my building that will easily add an additional 30 minutes or more to my day.

I don't have the option of moving closer--my salary and the cost of housing will not allow that. The idea of adding more time to a lengthy commute makes me reconsider my desire to continue to work here. It's that impactful.

Please consider adding a COE parking structure to the plans!

Julia

~~~~~

*Julia Konopasek*

Undergraduate Advisor & Scheduler  
Department of Civil and Environmental Engineering  
750 Davis Hall

Drop in Advising Hours:

Monday 1:15-4 pm

Tuesday 9-11:45am

Thursday 1:15-4 pm

Friday 9-11:45 am and 1:15-4 pm

IND  
35.1



Letter IND 36

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Garage

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**Karen Mendelow Nelson** <karenmn@berkeley.edu>

Tue, Mar 12, 2019 at 3:42 PM

To: planning@berkeley.edu

I am adding public comment regarding parking structure at Upper Hearst.

Since I live in Marin County, I must drive to work. Please consider in the plan for Goldman School Parking adding parking to be included as part of the structure.

The Upper Hearst structure is filled on every day of the academic year with the stacked parking. This change will be a great loss to those of us who work in this region of camps.

Best,

Karen Mendelow Nelson

--

Karen Mendelow Nelson  
Research Administrator/Grants Analyst

QB3  
BEST Region  
Biological/Environmental Science/Technology  
University of CA Berkeley  
Stanley Hall 206  
Berkeley, CA 94720-3220  
510-666-3636  
[karenmn@berkeley.edu](mailto:karenmn@berkeley.edu)

IND  
36.1

Draft Supplemental EIR to the  
2020 Long Range Development Plan  
Environmental Impact Report

**CEQA Public Hearing**

March 12, 2019

**Your Info:** *Please print legibly.*

Laurie Pfohl

Name

LAMP5454@gmail

Email

1815 Parker Street Berkeley

Address

**Comment Options for Public Record: TONIGHT**

**1. Oral**

Submit this card to the check-in table to make oral comments at tonight's hearing.

Each oral comment is limited to a maximum of **two** minutes.

**2. Written**

Use the space on the back of this card to provide written comments. Submit the completed card to the check-in table.

**Comment Options for Public Record: ADDITIONAL**

**1. Email**

Send comments to [planning@berkeley.edu](mailto:planning@berkeley.edu).

**2. Mail**

Send comments to: Physical and Environmental Planning  
University of California, Berkeley  
300 A&E Building, Berkeley, CA 94720-1382

Subject:

PEOPLES PARK

Comment:

Peoples Park should be kept a park. It is very neglected now but is used by many people from different walks of life when the weather is nice. The city should improve the park with better lighting & walkways, and less bushes. There are very few parks that are walking distance of the campus. Also the bathrooms should be relocated so the park looks more open and inviting.



195 The Uplands  
Berkeley, California 94705

March 12, 2019

Vini Bhargava, PMP, LEED AP  
Director, Physical and Environmental Planning  
300 A&E Building  
University of California Berkeley  
Berkeley, California 94720-1382

Re: Draft Supplemental EIR (SEIR), 2020 LRDP/Upper Hearst Development

Dear Ms. Bhargava:

This SEIR is difficult to take seriously, except that it must be taken seriously. It is a powerful maneuver on paper foretelling of further potential disruption within the City of Berkeley, once a place of the town & gown. Now, it has come to pass that the University has gained such a position of undiminished strength (except perhaps in regards to its mysterious debt obligations) so that it's a legitimate question as to whether the citizens of this town may actually have a seat-at-the-table when considering significant environmental impacts. The proposed Upper Hearst Development and the proposed "minor" expansion of student enrollment, each as presented in this SEIR, would already appear to be *fait accompli*, for different reasons.

IND 38.1

The Upper Hearst Development is, in fact, a jarring, massive brutalist structure attached to a common, tasteless oversized housing complex. Indeed, as the SEIR establishes the Upper Hearst Development would virtually diminish the historic and inspirational character of one of Berkeley's most important, seminal structures — the Beta Theta Pi Fraternity of 1894, now the Goldman School of Public Policy. And, yes, if built as proposed, the Upper Hearst Development would adversely dominate all corners of the surrounding environment. And, yes, if built, the project would also diminish a fragile, yet still existent historic interface between UC's Berkeley Campus Park and the City's historic Northside neighborhood.

IND 38.2

Yet, now is the time to ask: what is the justification to go forward with the Upper Hearst Development, as proposed, if the SEIR deems that it will have a "significant and unavoidable impact"? Is it to further denigrate a cherished, irreplaceable, and significant environment? If not, then is there an urgency to expand the Goldman School of Public Policy? To build housing? Immediately? Are there time-sensitive donation(s) attached? And, or, is there a particular

IND 38.3



urgency to construct the adjoining housing and parking complex? Is there an urgency to monetize UC's property holdings, linking such properties to housing investment and profit returns, as soon as possible (as Chancellor Christ has spoken)? Is there a time-sensitive deal, or contract, waiting in the wings? Is there investment money that must be utilized ASAP?

IND 38.3

If the answers to any, or all, of the above questions are in the negative, then new opportunity should be given, including extended time, to redesign the Upper Hearst Development, including its façade(s), its footprint, and its massing. Toward this end, the Berkeley Architectural Heritage Association's SEIR comment letter is most helpful. Using old photos, the letter reveals that in the 60s when UC took domain of this block and this site, it proceeded to actually demolish standing historic structures that were each large institutional facilities, inclusive of large gathering spaces and substantial student housing units (Newman Hall, College Hall and, of course, Beta Theta Pi). Each was designed then to enhance the hillsides, the spirit, and the beautiful rhythms of "building with nature."

IND 38.4

At this time might it be possible for UC's administrative and planning leadership to re-emerge in respect to concerns expressed by the Berkeley community? Actually, wouldn't the Goldman School teach its students that respect for environmental footprints, wherever, local or world-wide, is basic to good public policy, good citizenship, individually and institutionally? Wouldn't the Goldman Environmental Fund advocate such aspirations too? Perhaps, there might be a dust-off memory to remember when proposed developments along the Hearst Avenue corridor that were tweaked, adjusted, and/or radically re-directed to preserve and protect irreplaceable architectural resources. Isn't it worth recalling the dynamic campaign to save the Naval Architecture Building (currently part of the Blum Center for Developing Economics), the adaptive reuse of North Gate Hall, once home of the Architecture Department (currently the Graduate School of Journalism), and the conscious effort to build the Foothill Housing Complex to be contextually sensitive. Then, too, there is the contextual award-winning addition to the Goldman School, undertaken by the architectural firm Architectural Resources Group.

IND 38.5


It would appear entirely inappropriate that this SEIR attempts to mix review of the physical impacts of the Upper Hearst Development with the complex matter of a "Minor" Amendment to 2020 LRDP EIR *vis.a.vis* increased student enrollment. Neither does it seem credible to claim that an increase in student enrollment is a condition for construction of the housing component in the Upper Hearst Development. It does not appear to be germane to become as a tag on to any Goldman School expansion or any single student housing facility.

IND 38.6

The current increased student enrollment, *already* surpassing the 2020 LRDP, is a multifaceted issue in itself, seemingly to mandate that serious environmental review occur ASAP, but within its own parameters and definitions, so that the wider community and the University may develop a new understanding. Questions of environmental impact to the greater City environs are currently outstanding — for instance, how are the current building(s) under construction (building at the Center for Independent Living site, building at Berkeley Inn site, corner of Haste and Telegraph) specifically being built for UC students. Such under the radar contracts between private investment enterprises and the UC administration need to be and should be discussed in a separate EIR process. Plus, an analysis of expansion of the use of UC's own facilities, its current real needs, all new analysis, for example: the Student Union Building, once for used for public student gatherings, now used for such commercial entities as Amazon (see attached).

Thank you for your attention and consideration.

Sincerely,

  
Lesley Emmington

[Login / Create Account](#)

[SUBSCRIBE](#)

OAKLAND, BERKELEY, AND EAST BAY NEWS, EVENTS, RESTAURANTS, MUSIC, & ARTS  
NEWS & OPINION » NEWS FEBRUARY 06, 2019

## Amazon Works Hard to Keep Secrets

Under its agreement with UC Berkeley, the online giant can seek to block the release of public records or redact parts of them.

By Camille Fasset

Email

Tweet

Print

click to enlarge



Photo by Jason Paladino

Amazon has operated a location on the Cal campus since January 2016.

After Amazon announced last year that it will establish new headquarters in New York City and Washington, D.C., a technology editor for Slate uncovered a written agreement between the online giant and both cities, requiring them to notify Amazon of any public records requests. Under the pact, Amazon could seek to block the public records request in court or redact information before it was released. The *Express* has learned that Amazon is requiring the same from UC Berkeley in relation to the company's facility on campus.

According to the details of the mutual nondisclosure agreement and lease, which were obtained and reviewed for this report, Amazon's agreement with UC Berkeley's ASUC Student Union includes a requirement that the school notify the company of any public records requests made by citizens, the news media, or anyone else and to give Amazon time to request that redactions or exemptions be made from documents that would otherwise be released to the public.

Amazon officials confirmed that this language is standard in the company's real estate deals with public agencies, but declined to comment on the agreements.

The company has run a study-space and package-pickup location on the Cal campus since January 2016. Amazon's director of student programs said that when the space opened, its environment was optimized to be inviting, so that students could be turned into "lifelong customers," according to a report in *Berkeleyside*.

Some students have long been concerned about the impacts of Amazon moving onto campus.

jurisdictions — Amazon would be promptly notified of any relevant public records requests, allowing the company to request exemptions and redactions before release.

The UMass agreement included guaranteed payments from Amazon in amounts of \$375,000 in the first year, \$465,000 in the second year, and \$610,000 in the third year. By contrast, UC Berkeley's agreement lists a guaranteed royalty/rent payment of \$200,000 annually for five operational years.

Amazon is far from the only large technology company that has sought to secure "early warning systems" for FOIA. Facebook has also demanded advance notification of requests, and reportedly obscured its identity through the use of code names in public documents.

The copy of the University of California's lease with Amazon also included a redaction. On page A-20 of the document, a giant black box takes up most of a page under a label of "diagram of premises." It's unclear why this diagram was redacted, or if the decision to do so was made purely by UC Berkeley, but according to the terms of the agreement, Amazon would have the right to request it redacted.

*Contact the author of this piece, send a letter to the editor, like us on Facebook, or follow us on Twitter.*

« Among the Lucky Ones

Aisha Wahab Made History »



Letter IND 39

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Parking

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**Maribel Castillo-Glaze** <maricastillo@berkeley.edu>

Tue, Mar 12, 2019 at 12:10 PM

To: planning@berkeley.edu

Hello,

I am a staff employee who currently uses Upper Hearst Parking. The plan to demolish parking without plans for staff employees to park it's incomprehensible. Where do we suppose to park? Do you know how much it cost to take public transportation? Are there any incentives planned? Staff employees keep taking all the hits without consideration to our needs. We need more parking not less!

IND  
39.1

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Maribel Castillo-Glaze  
~~Admissions Staff

Academic Affairs Office  
Civil and Environmental Engineering  
750 Davis Hall  
UC Berkeley  
Berkeley, CA 94720-1710  
(510)643-6640



Letter IND 40

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Please consider alternative parking lot for Staff and Professors in the area of Upper Hearst! Raphael Breines,**

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**Mary West** <mwest@berkeley.edu>

Tue, Mar 12, 2019 at 6:08 PM

To: planning@berkeley.edu

Hi, this is very bad news indeed. This parking lot is used by career professors and staff who are dedicated to spending as high percentage as possible at campus doing their high level of work. The garage is packed every single day with the stacked parking and if you demolish this building those who use it will spend quite a lot of time finding parking parking elsewhere (they often live in Moraga, Walnut Creek, Danville, etc) unless you find an alternative close by. Unless something is found close by, 45 min of time/day will be spent using BART and walking or catching the every 30 min bus, finding parking where there are spaces and walking, or I'm not sure what other alternatives you are imaging. Please have respect for your PIs and staff and have a solution for them if you are going to take this parking garage away. You know already that UCOP has that parking is an issue, this could impact PI retention as well if you do not have a good solution.

Sincerely,  
Mary West

--

Mary West, PhD

Staff Research Associate IV/  
QB3 Shared Stem Cell Facility and High-Throughput Screening Facility Director

SSCF Lab: B129 Stanley Hall  
LKS Lab: 461 Li Ka Shing Center  
Office: B108 Stanley Hall  
Berkeley, California 94720-3220

Lab Phone: 510-664-4112

[mwest@berkeley.edu](mailto:mwest@berkeley.edu)QB3 SSCF/HTSF Website: [qb3.berkeley.edu/sscf-htsf/](http://qb3.berkeley.edu/sscf-htsf/)



Letter IND 41

Planning Departmental &lt;planning@berkeley.edu&gt;

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**DEMOLITION OF THE UPPER HEARST PARKING GARAGE**

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**Phyllis Broadnax** <pbroadnax@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Tue, Mar 12, 2019 at 3:33 PM

Raphael Breines,

I am writing with complete disgust and disappointment in the University of California continually taking away parking places from the employees who make this place run with the ruse of making it easier for the students and faculty!!! What are we????? We work hard for this place and am totally dismayed as to how you all just pull the rugs from under us and we're to just go with the flow!!!!

EVERY YEAR I PAY \$1,200+ for parking and cannot take public transportation to and from work as I have a small child to pick up and need to pick him up before 5:45pm and my supervisor will not negotiate a time for me to leave to take public transportation and get to my child in time. I must travel 17 miles each way and need to park in a lot; I do not wish to walk all the way down Hearst Avenue to the Lower Hearst parking lot; I have arthritis and cannot do all of that walking up and down hills!!! And I'm so sure there are other employees who feel the same way.

When I first started working here in 2007, I was so excited, but as I have stepped back and taken a look at how this place runs, I have become jaded and disillusioned with this place. I was hoping to retire from UC in 4 years, but if the University cannot accommodate the employees sometimes, I may have to resort to looking for other employment.

Why don't you take employees into consideration instead of unceremoniously tossing us to the side?????

Sincerely,

--  
Phyllis Y. Broadnax  
Administrative Assistant  
Unit 4 Housing  
510-642-9703

IND  
41.1





Letter IND 42

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Demolition of Upper Hearst Parking Lot and impact on staff

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**Reed Helgens** <rhelgens@berkeley.edu>

Tue, Mar 12, 2019 at 1:35 PM

To: planning@berkeley.edu

My concern is in regards to the impact on staff commute costs and time.

The cost of public transportation will increase my commuter cost, adding shuttles and working with a BART schedule adds additional transportation time (and stress). I frequently work late, as many in my office do, a cross campus walk from the top of campus to the bottom in the dark to reach BART is also a concern.

IND 42.1

I would like to propose two suggestions to minimize the impact of the loss of the parking garage, during construction and after, as the new parking area will have reduced parking spots.:

IND 42.2

1. Encourage more telecommute days be allowed, permitting telecommuting 3 days a week if the position is able to be managed successfully off campus as well as in the office.

2. Share parking spots, where a subset of staff in the same office/building/department rotates days that a parking spot is used to match days when they are not telecommuting.

IND 42.3

Reed Helgens

**Reed Helgens**

ERSO

353 Cory Hall (MC: 1774)

Berkeley, CA 94720-1774

510-664-9081

[rhelgens@berkeley.edu](mailto:rhelgens@berkeley.edu)

(Telecommute on Mondays.)



Letter IND 43

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Re. Upper Hearst parking garage demolition**

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**Rita Nichiporuk** <nichiporuk@berkeley.edu>

Tue, Mar 12, 2019 at 5:58 PM

To: Planning@berkeley.edu

Mr. Breines,

Demolition of upper Hearst parking structure, if implemented, will deteriorate parking situation at UC Berkely campus from terrible to absolutely unbearable. For those employees who cannot afford to live within walking distance form campus and public transportatin and have to drive from far away because of outrageously high housing costs it will only mean additional stress and suffering.

It is ironic that Goldman shool of PUBLIC POLICY is getting built at the expense of unfortunate campus employees, which is REALLY BAD PUBLIC POLICY.

IND  
43.1

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Dr. Rita Nichiporuk  
QB3 Mass Spectrometry Facility  
B207 Stanley Hall  
University of California  
Berkeley, CA 94720  
<http://qb3.berkeley.edu/msf/>  
Phone: (510) 666-3373



Letter IND 44

Planning Departmental &lt;planning@berkeley.edu&gt;

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## I object to this change

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**Ruzena BAJCSY** <bajcsy@eecs.berkeley.edu>

Tue, Mar 12, 2019 at 10:27 AM

Reply-To: bajcsy@eecs.berkeley.edu

To: planning@berkeley.edu, Ruzena Bajcsy &lt;bajcsy@eecs.berkeley.edu&gt;

I am an older faculty, have hard time to walk and I do come to school every day.  
For me this change will cause hardship,  
Ruzena Bajcsy

| IND 44.1



Letter IND 45

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Parking Garage project

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Ryan Rivers &lt;rrivers@berkeley.edu&gt;

Tue, Mar 12, 2019 at 10:29 AM

To: planning@berkeley.edu

Dear Raphael Breines,

I am writing regarding the replacement of the Upper Hearst Parking Garage. This garage serves the entire northeastern corner of campus and losing it for 23 months will be a significant impact on all operations. Northeastern campus has some of the highest building density on campus, and parking is already critically impacted. As campus has no reasonable plan to expand parking prior to this development effort, I need to lodge a strong complaint on the matter. So let me be clear:

IND 45.1

**This is a scheduled logistics disaster. Plan better than this.**

Campus needs the housing. We could get on board with that if the issue were temporary. However, we're looking at losing up to 218 parking spaces in the northeastern section of campus, which provide some of the only ADA accessible parking spaces for the area - which is an ADA lawsuit waiting to happen. There are no plans for parking developments nearby. Campus has actively damaged the benefits of our staff members for the last decade. Major pension changes, removal of popular health plans due to expenses, and several other structural benefits have been hammered. Meanwhile, our salaries are stagnating. In the middle of all of this, Parking and Transportation charges for *the ability to park at our own workplace*. Now campus planning wants to take one of benefits we **pay for** and turn it into housing for a department with minimal presence in the engineering corner of campus? Seriously? Do you want to trigger a unionization of professional staff? This is how you trigger a unionization of professional staff. People are not happy. You are going to disrupt the lives of my colleagues dramatically. Take the entire engineering college and run it 20% less efficiently for 2 years - see how the chancellor likes that plan. Think about how that affects hundreds of staff careers and work/life balances when they have to plan an additional 30 minutes of commute time since lower hearst is going to be so impacted that we can't even park there. If BART has any issues at all I'm just going to call in sick, **because I will be unable to park at my workplace**.

IND 45.2

The upper hearst garage does not serve our community well - it needs replacing. We can agree on this. We could survive a 23 month development if our campus planning department actually took the time to:

- a) ensure temporary parking solutions were available
- b) ensure that we wouldn't lose 200+ spaces out of 345. That's more than half of the parking in the area gone.

This is UC Berkeley. We can do better than this. Build a new parking lot for staff before tearing down a core component of our daily lives. Build another level of parking into the new structure. We are a core stakeholder in this project, and we are being treated like peasants who don't matter. Give us a reason not to hate this idea.

-Ryan

--

Ryan Rivers  
R&D Engineer 3 - Process Staff  
UC Berkeley Marvell Nanolab  
510-809-8627



Letter IND 46

Planning Departmental &lt;planning@berkeley.edu&gt;

## Destruction of Upper Hearst Parking Lot

**Shelley OKIMOTO** <okimoto@ce.berkeley.edu>

Tue, Mar 12, 2019 at 10:47 AM

Reply-To: okimoto@ce.berkeley.edu

To: planning@berkeley.edu

Hi there,

Please do not destroy our parking lot!!!!!! Because of our constantly increasing workloads, we (faculty, staff and students) spend a lot of time on campus, working early and late, and the destruction of our parking lot will cause significant delays in our being able to work and being able to spend time with our families. None of the parking lots are under utilized, including Lower Hearst. This destruction will lead to:

- 1) employees spending more time, gas, and energy hunting for parking at a time when we want to decrease our footprint as a campus. Many commute from far away - this will just add to their work time and detract from home time, leading to an unhealthy balance.
- 2) increased traffic around campus. (We already have enough of that!)
- 3) possible loss of engineering faculty and staff. The College of Engineering brings in a lot of money to the university. Our faculty are also highly recruited by industry and other universities. This will give them one more reason to leave us.
- 4) more difficulty recruiting faculty. For those who want to live away from campus, commuting here will be even more difficult. I suspect that the ones who end up living so close to compus and the dorms will end up with students bothering them more than they would like.
- 5) more workman's comp claims/lawsuits for injuries and accidents from rushing too much, traveling to and from University parking to our offices and meetings, especially with a shuttle that only runs every 20 mins, or allowing motorized ped vehicles to be used for regular transit.
- 6) losing even more contact with emeriti and reitirees (it's already hard enough for them to get here). We have some willing to teach and participate with our students or who still are doing research with their colleagues who won't come here because of traffic and distant parking.

Besides that, how is a plan that replaces close to 400 parking spaces, moving 100 of them across campus, going to work? What about the other 300? Most of our transit systems are overloaded (there's no parking at BART) and cost an exhorbitant amount now - close to what we're paying in parking fees - with much less convenience.

Please reconsider your plan to demolish the Upper Hearst Parking Lot.

Thank you,  
Shelley Okimoto

--

Shelley Okimoto  
Graduate Student Adviser  
Civil and Environmental Engineering  
750 Davis Hall  
University of California, Berkeley  
Berkeley, CA 94720-1710  
510.643.8944 phone  
510.643.5264 fax  
[okimoto@ce.berkeley.edu](mailto:okimoto@ce.berkeley.edu)

Drop-in hours: M. 1:15-4, Tu 9-11:45, Th 1:15-4, and F. 9-11:45 and 1:15-4  
or by appointment.

IND  
46.1

## Re: Fwd: FYI: Upper Hearst Parking Garage Project

**Wenjun Zhang** <wjzhang@berkeley.edu>  
To: planning@berkeley.edu

Tue, Mar 12, 2019 at 3:48 PM

Dear Raphael,

I am aware of this campus plan today and am really concerned about my future commute as an annual C holder in Stanley hall. I drive to work every day and notice that this parking lot is always full during the day. There is no other big enough parking lot nearby to accommodate a big population from college of engineering and chemistry. I feel this parking lot at this particular corner of campus is absolutely needed.

IND  
47.1

Best,

Wenjun

On 3/12/2019 3:36 PM, QB3 Facilities wrote:

Dear Stanley Hall Occupants,

Lots of notice to you if you use Upper Hearst Parking Structure. It is slated for demolition in October of 2019 to make way for the expanded Goldman School of Public Policy. You may provide feedback to campus planning if you wish. Instructions are in the attached flyer.

Harry Stark

----- Forwarded message -----

From: **Susan MADISON** <swmadison@berkeley.edu>

Date: Tue, Mar 12, 2019 at 11:00 AM

Subject: FYI: Upper Hearst Parking Garage Project: Public Meeting Notice for today, March 12th, 2019

To: Daniel Plumlee <dplum@berkeley.edu>, Harry STARK <hstark@berkeley.edu>, Charlotte Hryse <chryse@berkeley.edu>

hello,

College of Engineering Facilities was just informed very recently of this meeting concerning the demolition of the Upper Hearst Parking Structure for the Goldman School Project.

We are notifying the engineering buildings of this meeting with the attached notice. you are welcome to use it as a reference if you want to notify your building occupants....  
...some of who may park in the Upper Hearst Parking Structure.

regards,  
susan

--

=====

Susan Madison, Facilities Project Manager  
University of California, Berkeley  
College of Engineering Dean's Office  
Facilities and Capital Projects  
205 McLaughlin Hall MC1700 - Berkeley, CA. 947201-700  
Tel: (510)643-2055 Fax: (510)642-7654  
Email: [susan@coe.berkeley.edu](mailto:susan@coe.berkeley.edu)

=====

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3/13/2019

UC Berkeley Mail - Re: Fwd: FYI: Upper Hearst Parking Garage Project

Wenjun Zhang, Ph.D.  
Associate Professor  
Charles R. Wilke Endowed Chair  
Chemical and Biomolecular Engineering Department

201 Gilman Hall, MC 1462  
University of California  
Berkeley, CA 94720

Tel: (510) 643-8682  
Email: [wjzhang@berkeley.edu](mailto:wjzhang@berkeley.edu)  
<http://www.cchem.berkeley.edu/wzgrp/>



Letter IND 48

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Fwd: Alternate parking during Goldman project?**

---

**Bill Boyd** <bboyd@astro.berkeley.edu>  
To: planning@berkeley.edu

Wed, Mar 13, 2019 at 10:47 AM

Dear Raphael,

I don't see this as a comment but rather a question so I sent it to Capital Projects, but you may want to have it for your feedback.

Cheers,  
Bill Boyd

Begin forwarded message:

**From:** Bill Boyd <bboyd@astro.berkeley.edu>  
**Subject:** Alternate parking during Goldman project?  
**Date:** March 13, 2019 at 10:28:48 AM PDT  
**To:** [capitalstrategies@berkeley.edu](mailto:capitalstrategies@berkeley.edu)

Dear Capital Projects,

I usually park my car in the UC lot at the corner of Ridge and La Loma. I saw the green flyer about the planned parking garage demolition in October 2019. Will there be an equivalent number of alternative parking spaces available during the Goldman project, or is the overall number of campus permit spaces being reduced? I am asking in order to figure out how to adjust my commute.

IND 48.1

Thanks,  
Bill Boyd

---

Bill Boyd  
System Administrator UCB Astronomy  
[bboyd@astro.berkeley.edu](mailto:bboyd@astro.berkeley.edu)  
510-642-3163

---

Bill Boyd  
System Administrator UCB Astronomy  
[bboyd@astro.berkeley.edu](mailto:bboyd@astro.berkeley.edu)  
510-642-3163





Letter IND 49

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Upper Hearst Parking**

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**Charles Pugh** <pugh@math.berkeley.edu>  
To: planning@berkeley.edu

Wed, Mar 13, 2019 at 2:17 PM

Hello —

Last night when I left campus there was a paper flier on the windshield of my car which was parked in the Upper Hearst parking structure. It announced the demolition of that structure, starting in the Fall of 2019, and with no replacement for two years. Even then the reduction of the faculty parking spaces would be by a factor of nearly 2/3, and that does not include the number of special reserved spaces.

The windshield flier is the first public information on the demolition plans I have seen, and I think that is the same for most members of the Math Department. It appears that the demolition decision has already been made, and it has been done without consultation with the faculty most affected.

I am appalled.

I read in Professor Bokor's email that Parking and Transportation "hopes to buy out any available spaces in the Maxwell Field private lot" and that "this would allow F & C permit holders to park there during construction." The email does not indicate how many spaces there might be.

Please tell me what numbers you anticipate in the Maxwell Field lot.

Sincerely, Charles Pugh

Lack of parking would be likely to terminate my connection with UCB, and it would certainly end any "Big Giving." It would also discourage many prospective faculty members from taking positions here.

IND  
49.1



Letter IND 50

Planning Departmental &lt;planning@berkeley.edu&gt;

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**GSPP Housing Project**

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**Felicia Bautista** <fbautista3@berkeley.edu>

Wed, Mar 13, 2019 at 10:44 AM

To: planning@berkeley.edu

Hello,

My name is Felicia Bautista, and I am a Graduate Advisor in CEE, and an Undergraduate Advisor for Engineering Science. I have concerns about the new GSPP housing project, and the affects it will have on our parking situation.

I think that demolishing the Upper Hearst Parking Structure will have a negative affect on the COE employees. If we permanently lose 300+ parking spots on this side of campus with no plans to replace them, I think this would really hinder the quality of our work. On the staff end, it already feels like this campus doesn't appreciate us for the work that we do, and this is another reason why many staff already feel this way. With another resource being taken away from the staff, I know that we will find a way to continue with all of the work, since that is the standard that is set upon the staff. However, this will make it harder for staff to work with the faculty, if the faculty can't even make their way to campus due to no parking. Many of the faculty do not arrive to campus until after 10am, and by that time, I know that parking is already tight at the Upper Hearst Parking Structure. There will be an overflow of parking in the other lots, but I can't imagine them even wanting to take a further walk to their offices/classes. They already push back if they have to teach in another building that isn't located where their office is! Sometimes we can't reach our faculty unless we find a way to see them in person in passing, in their office, or in our lounge!

With all of the other changes that the campus is making, this will be another reason that the Engineering Faculty will want to leave. And I know that the Engineering Faculty bring in a lot of money to our campus. What's going to happen if they leave? It will discourage the Emeriti to come to campus and share their experiences as well.

Many staff won't be able to continue their flexible work schedules with this change. Some staff have to work second jobs to make ends meet, and this will make it harder for them to be able to do so.

Please do not remove the Upper Hearst Parking Structure unless there is a plan to replace the loss of spots. Thank you for your consideration.

Regards,

**Felicia Bautista**

University of California, Berkeley

Undergraduate Student Services Advisor  
Department of Engineering Science

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Graduate Student Advisor  
Department of Civil and Environmental EngineeringIND  
50.1



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## Public Comments: Upper Hearst Development Project

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**Felicia Bautista** <fbautista3@berkeley.edu>

Fri, Mar 15, 2019 at 11:07 AM

To: Planning Departmental <planning@berkeley.edu>

Hello,

My name is Felicia Bautista, and I am a Graduate Advisor in CEE, and an Undergraduate Advisor for Engineering Science. I have concerns about the new GSPP housing project, and the affects it will have on our parking situation.

I think that demolishing the Upper Hearst Parking Structure will have a negative affect on the COE employees. If we permanently lose 300+ parking spots on this side of campus with no plans to replace them, I think this would really hinder the quality of our work. On the staff end, it already feels like this campus doesn't appreciate us for the work that we do, and this is another reason why many staff already feel this way. With another resource being taken away from the staff, I know that we will find a way to continue with all of the work, since that is the standard that is set upon the staff. However, this will make it harder for staff to work with the faculty, if the faculty can't even make their way to campus due to no parking. Many of the faculty do not arrive to campus until after 10am, and by that time, I know that parking is already tight at the Upper Hearst Parking Structure. There will be an overflow of parking in the other lots, but I can't imagine them even wanting to take a further walk to their offices/classes. They already push back if they have to teach in another building that isn't located where their office is! Sometimes we can't reach our faculty unless we find a way to see them in person in passing, in their office, or in our lounge!

With all of the other changes that the campus is making, this will be another reason that the Engineering Faculty will want to leave. And I know that the Engineering Faculty bring in a lot of money to our campus. What's going to happen if they leave? It will discourage the Emeriti to come to campus and share their experiences as well.

Many staff won't be able to continue their flexible work schedules with this change. Some staff have to work second jobs to make ends meet, and this will make it harder for them to be able to do so.

Please do not remove the Upper Hearst Parking Structure unless there is a plan to replace the loss of spots. Thank you for your consideration.

Regards,

**Felicia Bautista**

University of California, Berkeley

Undergraduate Student Services Advisor  
Department of Engineering Science

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Graduate Student Advisor  
Department of Civil and Environmental Engineering



Letter IND 51

Planning Departmental &lt;planning@berkeley.edu&gt;

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## GSPP building and Upper Hearst Parking Structure

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Jack MOEHLE <moehle@berkeley.edu>  
To: planning@berkeley.edu

Wed, Mar 13, 2019 at 2:45 PM

**I am writing to protest this project** not only because of the reduction in parking access for the College of Engineering but because of the utter lack of consultation with the College of Engineering for the long period that this has been in planning.

The loss of nearby parking will badly impact staff and faculty of the College of Engineering. We are all overworked and underfunded - to have the added stress of longer and more complicated commuting is unacceptable. The proposed options to make up for the 300 lost parking spots are completely inadequate. The dreamers who think trudging across the hilly campus in varying weather or adopting an alternative means of getting to campus are not considering the varied conditions of Berkeley's employees. It is too bad they never bothered to ask those affected.

If this project goes forward, it is your responsibility to find an alternative that works and does not add to the challenges of working at Cal.

Jack Moehle  
Professor, Civil and Environmental Engineering

IND  
51.1

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## Comments on Upper Hearst Parking Garage demolition

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**Jeannie Powers** <jeannetherese@berkeley.edu>

Wed, Mar 13, 2019 at 7:59 AM

Reply-To: jp4@berkeley.edu

To: planning@berkeley.edu

Dear Raphael Breines,

I'm writing to provide comments on the demolition of Upper Hearst Parking Garage.

I understand this will create a hardship or perceived hardship for many employees. I feel the University can do more to focus on those who may at first perceive a hardship, but actually have other options for getting to work. I think many people who now drive solo to campus can turn to other options such as biking, carpool, and public transit. I would like the University to do more to incentivize these other modes of transportation.

I realize some employees may have obligations outside of work that require them to have the flexibility of driving alone. But my sense is that most solo drivers can change their driving habits, but this requires a shift in culture; incentives can ease people into the change. How about... reduced BART tickets, financial incentives to bike, further reduction in the cost of carpool parking passes, carpool-only parking spaces, promotion of tools and resources to link carpoolers, etc.

Another idea - with more employees working remotely some days of the week, is there a way to strategically share parking passes or spaces?

Just to give you an idea of where I'm coming from - for the past 2 years I've typically taken BART to work but occasionally drive myself, using daily scratcher permits. Before that I carpooled for about a year (I found my group on Zimride). Just this week I've tested out carpooling with some neighbors I met in my apartment building.

Thank you for your consideration.

**Jeannie Powers**

Research Administrator

University of California, Berkeley

BEST (Biological, Environmental, Science & Technology) Region

206 Stanley Hall

Berkeley, CA 94720-3220

Office: 510-664-9963

Cell: 415-205-6009

[jp4@berkeley.edu](mailto:jp4@berkeley.edu)

IND  
52.1

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**Input on DEIR/GSPP Project**

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**Ruben Lizardo** <rlizardo@berkeley.edu>

Wed, Mar 13, 2019 at 11:10 AM

To: UC Berkeley Planning &lt;planning@berkeley.edu&gt;, Raphael Breines &lt;rbreines@berkeley.edu&gt;, sitar@berkeley.edu

Hi Rafael

I hope your morning is going well. This email is to let you know that I am forwarding comments that College of Engineering Professor Nicholas Sitar would like added to the record of comments on the DEIR/GSPP project on upper Hearst. You and Professor Sitar had a conversation that I joined. He had to leave before he could make his comment verbally or fill out and submit a comment card. I have included the email address that is posted on the website too.

From Professor Nicholas Sitar

I am just following up on our conversation yesterday on the negative impact the loss of parking will have on staff and faculty of neighboring departments and schools. I am faculty in the College of Engineering. The point that the Chancellor and her advisor should get that, in the case of Upper Hearst parking, several hundred dedicated campus employees and faculty were and are being treated shabbily to say the least. One of the few, in fact the only perk, of working on Campus for most of these was and is convenient parking and that is being taken away without any honest attempt to provide a reasonable alternative or compensation. \$10 a month to BART ticket is a joke! Anyway... enough said.

IND 53.1

The other concern Professor Sitar raised is about public notice for the projects like the one we are planning on upper Hearst. Professor Sitar would like the campus to ensure that notice of Community Open Houses or Public Hearings on projects are sent to Deans, Department Chairs, and Facilities managers of neighboring buildings. So that these folks can get the information out to faculty, staff and students who may also be impacted by proposed projects.

IND 53.2

Thanks for letting me and Professor Sitar if these two comments can be entered in to the public record that we will respond to at the end of the comment period.

Ruben

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Ruben Lizardo  
Director, Local Government and Community Relations  
Office of the Chancellor

2200 Bancroft Way  
Berkeley, CA 94720  
510-643-5296 Office  
510-417-9230 Cellular



150  
YEARS  
OF LIGHT



Letter IND 54

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Comment on upper Hearst

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**Daniel Ioan TATARU** <tataru@math.berkeley.edu>

Thu, Mar 14, 2019 at 10:31 AM

Reply-To: tataru@math.berkeley.edu

To: planning@berkeley.edu

In my opinion the plan to replace the parking garage is poorly thought, and will make an already bad parking situation even worse. As I read it there is no reasonable plan in place to replace the lost faculty parking spots, neither in the short run nor in the long run. This may well be the final straw to push some of our best faculty from the departments in the NE side of campus away from Berkeley.

Any construction plan there should be accompanied by a matching plan to replace the lost parking in the proximity (and not, for instance, with a Clark Kerr shuttle ! that would be a paper plan which would die at the first contact with reality).

Daniel Tataru

Professor

Mathematics

IND  
54.1



Letter IND 55

Planning Departmental &lt;planning@berkeley.edu&gt;

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## the size of the proposed Public Policy building

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**Ruth Rosen** <ruthrosen3@gmail.com>

Fri, Mar 15, 2019 at 4:43 PM

To: planning@berkeley.edu

As a retired faculty member who once taught public policy, I want to inform that the proposed project way too big, too tall, and out of proportion with the neighborhood. I support the reduced scale alternative which is large enough. | IND 55.1

Ruth Rosen

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Ruth Rosen

Professor Emerita of History, University of California, Davis

Center for the Study of Social Change, U.C. Berkeley

Author, "The World Split Open: How the Modern Women's Movement Changed America"

email: [ruthrosen3@gmail.com](mailto:ruthrosen3@gmail.com)web site: [www.ruthrosen.org](http://www.ruthrosen.org)

twitter@Ruth\_Rosen





Letter IND 56

Planning Departmental &lt;planning@berkeley.edu&gt;

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## I support the Golden School of Public Policy and Student housing Project

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**Topher Brennan** <topher.t.brennan@gmail.com>

Mon, Mar 18, 2019 at 10:54 AM

To: planning@berkeley.edu

I'm a Berkeley parent, writing to let you know that I strongly support Berkeley's new student housing project, and I hope you ignore the bad-faith attacks on the project from NIMBYs.

In particular, I want you to know that the demands for a so-called "full EIR study" are not in good faith. I've seen the people behind this effort speak at city meetings, and been shocked by the way they demonize students as outsiders Berkeley needs to be protected from, rather than valued members of our community. That attitude—not any genuine concern for the environment—is what motivates the opposition to this project.

I know UC Berkeley is a great school, and if my son chooses to go there after graduating high school, I hope there's plenty of student housing on or near campus for him. I hope doesn't have to deal with NIMBYs showing up to city council meetings declaring him to be the enemy.

The NIMBYs are going to tell you that he should just go to a different UC school in a more "affordable" housing market instead. This is ludicrously hypocritical. We wouldn't have a shortage of affordable student housing in Berkeley if not for NIMBY opposition to any and all new student housing.

I won't be able to make it to the public comment meeting on Thursday, because I have another commitment that night. But I hope you'll realize that the NIMBYs that flood these meetings are not representative of the broader Berkeley community, and treat them accordingly.

Best,  
Topher Brennan

IND  
56.1

Erika R. Shore  
1731 Milvia Street  
Berkeley, CA 94709  
[ShoreErika@cs.com](mailto:ShoreErika@cs.com)

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California, Berkeley  
300 A & E Building  
Berkeley, CA 94720-1382  
[Planning@berkeley.edu](mailto:Planning@berkeley.edu)

March 19, 2019

Re: Upper Hearst Draft Supplemental EIR

Dear Mr. Breines,

I have lived in Berkeley since 1973, and in the same house since 1977. I have become aware of the plans by the University to enlarge the student population as well as to expand the academic space for the Goldman School of Public Policy (GSPP). I believe that both of these efforts will negatively affect the City and its residents and that there has not been ample justification for the need for either undertaking.

First, there is already a serious housing shortage in the City of Berkeley, and students suffer mightily from this reality. The UC system should be expanding its census in areas where more affordable housing is available (Merced, Riverside, Davis) not in the already dense and overly costly City of Berkeley. The plan includes housing for 150 students; but it is proposing to add 11,300 students. This is preposterous. Where are you expecting them to be housed? California's high school census of 17 and 18 year olds over the last 10 years has not grown proportionately to the proposed increase. (10% as opposed to 34% proposed increase in students at Berkeley) What is the justification for such huge growth? All of the attendant problems that accompany such growth such as crime, impact on traffic, infrastructure, etc. have not been justified nor have they been accounted for. This growth plan is unsupported by data or common sense.

IND 57.1

Second, why in the world does GSPP need so much more space? The proposal is to add 37,000 square feet in order to accommodate 5 additional employees and 30 more students. This is grossly disproportionate. At most, 1-2 classrooms would be required. In addition, the UC Memorial Stadium has ample space for meetings and events that GSPP can rent. The use of limited public funds for this expansion seems foolhardy; if UC has this money, let it be used to expand student housing which would seem to be a much higher priority.

IND 57.2

I implore you to shift the GSPP money to create student housing, and to limit the student growth to no more than 10%, the size of the growth of our high school population over the last several years. The data supports this sane, balanced type of plan. Please use your common sense to insure it is implemented. Thank you.

Sincerely,

Erika Shore



Letter IND 58

Planning Departmental &lt;planning@berkeley.edu&gt;

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**upper Hearst development**

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**Fran Segal** <seagull@sonic.net>  
To: planning@berkeley.edu

Mon, Mar 18, 2019 at 12:15 PM

Hello,

I'm writing to ask you to please select the Reduced Scale Alternative for the proposed project at Hearst and Ridge.

I am a neighbor who lives about one block away from this proposed development, and feel that the original plan would not fit the character of the neighborhood, and would create an abrupt bifurcation between the university and its environment.

I believe that with the scaled back alternative there is a greater possibility of creating a gradual and pleasant transition.

Thank you,  
Fran Segal  
Le Conte Ave.

IND  
58.1

## Lost Parking Due to Demolition of Upper Hearst Parking Structure

Iris D. TOMMELEIN <tommelein@ce.berkeley.edu>

Mon, Mar 18, 2019 at 12:54 PM

Reply-To: tommelein@berkeley.edu

To: planning@berkeley.edu

To whom it may concern:

I write to express my grave concern and protest to removal of approximately 300 parking spots near the North-East corner of our Campus, as a result of demolition of the Upper Hearst Parking Structure. (345 spots there now + 45 stacked; and 2 years later the new construction will have 90 spots). I understand there are no plans to replace these 300 spots although a shuttle service may be provided from other lots at some point in the future.

I use the Lower Hearst Parking structure daily. It tends to fill up between 9 and 10 AM. Then the stack parking spots fill up and around 11 AM all is chock-full. The days I have had meetings closer to the Upper Hearst Structure, I know the situation there is the same or even worse as it is a smaller structure.

If I come somewhat later in the day and have to go hunt for parking, which itself can take 15-20 minutes, often there is no time left to continue searching or checking out other, farther-away lots, and I end up paying for 2-hour street parking so that I can make it to my class or meeting on time. Then I have to go back later in the day to either move my car to a structure if space permits or find another metered spot in the street.

It is naive to think that the Lower Hearst Parking structure can provide any spill-over space. It is NOT the case!

Has a study been done to indicate that other lots on campus have the capacity to accommodate that many more cars on a regular basis? Is the capacity available or will the parking shortage in order areas of campus be made worse?

Consequently, if I want to come to work in the morning, I must come early to make sure I can park. If we lose 300 parking spots, the situation is going to get **much worse**. I may have to get to campus by 7 or 8 AM to find a spot. Not that I mind coming early. However, parking planners will know that in the situation we ALREADY are in, spaces get occupied for longer that way (when everyone comes earlier than the time they really need to be on campus), the situation exacerbates and thus the demand for parking will become even greater than it sh/could be.

If the GSPP project goes forward PLEASE CREATE **NEW ADDITIONAL PARKING ON THE NORTH SIDE OF CAMPUS!**

Sincerely,

Iris D. Tommelein  
Professor, Engineering and Project Management  
Director, Project Production Systems Laboratory (P2SL)

[p2sl.berkeley.edu](http://p2sl.berkeley.edu)



IND  
59.1





Letter IND 60

Planning Departmental &lt;planning@berkeley.edu&gt;

## concerns on upper Hearst development project

**Peter** <peterh@berkeley.edu>

Tue, Mar 19, 2019 at 5:52 AM

To: planning@berkeley.edu

Dear Planing committee

I am writing this message to express my deepest concern about the proposed upper Hearst building project. I send this message independently from the consolidated engineering response to this project which is currently written. I send this message as a simple member of our faculty.

A project that leads to the loss of 310 parking spots on north side to benefit a single small group of privileged faculty and does not contribute to the student, staff and faculty housing issue is a project that cannot be in the interest of this campus. 310 parking spots are 310 people that cannot come to work. The life's of 310 families who cannot afford to live close to campus and have to commute will be significantly more difficult if this project is realized. This project discriminates against the weakest and economically disadvantaged members of our community and puts the idea of shared governance into question. A few beneficiaries harm the large majority of the north side community. Further this project was not communicated to the Engineering community who is the most impacted. This cannot be the values of the UC Berkeley I know.

There are numerous arguments against this project and I will only list a few below.

- 1) Recruitment and retention of faculty and staff will be even more difficult in the future. People simply cant afford to live near campus and have to commute if you remove 310 parking spots please explain how people are supposed to come to work. Privileged and wealthy people will have little to no impact since they live nearby or can afford daily Uber rides while the already economically disadvantaged community members will yet again be discriminated against.
- 2) Alternative parking are not easily accessible to less mobile personnel and it is already full. Again, this project makes it impossible for less mobile members of our community to work here.
- 3) Fund raising will be very limited since we cannot bring potential donors to campus. Envision a donor has to hike through campus to an engineering department.
- 4) The result of this project will be that more faculty will work from home and spend less time with their students. People will spend the bare minimum on time on campus. Again, this cannot be in the campus interest.
- 5) This campus has done nothing to address housing for faculty and staff for decades. Instead of building more housing that benefits our community you are considering building housing for people who can pay for market value homes anyway. This makes no sense!! We need more university terrace projects not projects like this.
- 6) A small number of community members the GSPP is benefited while hundreds of others need to carry the load with private funds and private hardship.

I strongly urge you to reconsider this project in its current form. It will hurt our campus significantly and is an insult to the engineering community.

Best regards

Peter

--

Dr. Peter Hosemann

Professor and Department Chair  
Department of Nuclear Engineering  
University of California Berkeley  
4151 Etcheverry Hall

A-580

IND  
60.1

3/19/2019

UC Berkeley Mail - concerns on upper Hearst development project

Berkeley, CA, 94720

Lawrence Berkeley National Laboratory (LBNL)  
Faculty Scientist  
Material Science Division

Nuclear Materials Group:  
<http://materials.nuc.berkeley.edu/>

Phone: (c) 510 717 5752  
[peterh@berkeley.edu](mailto:peterh@berkeley.edu)



Letter IND 61

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Draft Supplemental EIR, 2020 LRDP/Upper Hearst Development**

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**Bob Kolenkow** <rkolenkow@earthlink.net>  
Reply-To: Bob Kolenkow <rkolenkow@earthlink.net>  
To: planning@berkeley.edu  
Cc: Henry DeNero <htdenero@gmail.com>

Tue, Mar 19, 2019 at 11:48 AM

Hello --

I have been the owner of a condominium at 1717 La Loma N1 (northeast corner of La Loma and Le Conte) since July 1986. It is wonderful having a "country" atmosphere so near a major university, which I appreciate as a retired physicist (MIT).

This part of North/East Berkeley has a long history of concern by residents to maintain the residential character, which has homes designed by the Maybecks, Julia Morgan, and Michael Goodman among others. In the early 1900s it was proposed to set up a grid pattern of streets in Daley's Scenic Park. This was opposed by the Hillside Club, which argued that the streets should follow the natural topography. The Hillside Club's steps and retaining walls characteristic of this neighborhood are still here today.

I have read the summary report of the proposed Goldman Upper Hearst Development and have seen the architect's rendering of the proposed project. I recognize the need for more space and more housing but the planned massive building seems to overwhelm this scenic area with its mass, height, and substantial area.

I have not seen a rendering of the Reduced Scale Alternative but it appears to call for a building complex of fewer stories and with attractive setbacks.

I recommend and support the construction of the Reduced Scale Alternative instead of the current Proposed Project.

Robert Kolenkow

IND  
61.1





Letter IND 62

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comments: Upper Hearst Development Project**

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**Brandy Thomas** <blthomas@berkeley.edu>

Tue, Mar 19, 2019 at 2:35 PM

To: planning@berkeley.edu

Good afternoon,

I am writing to you to express my concerns regarding the removal of the upper Hearst parking structure. The parking situation for those of us impacted is already pretty bad. I recently had an appointment with a specialist that I could not schedule at the end of the day. I took an Uber there and back because I was not optimistic that I would be able to secure a parking space upon my return.

IND  
62.1

I understand that campus is encouraging staff to consider public transportation. The location of my home makes it very difficult to take public transportation. In addition to it almost tripling the time it takes to get here, I have to make it back to Oakland by 6. Bart and bus will not allow for this.

Removing the parking structure will cause significant hardship to some of the staff. Lower Hearst cannot accommodate all of us (Is there a plan for additional parking at a different location?). I hope that the impact on the staff and faculty is truly a consideration when making the final decision for the Upper Hearst Development Project.

Regards,  
Brandy Thomas

Brandy Thomas  
Finance Manager  
Department of Bioengineering  
University of California, Berkeley  
306 Stanley Hall, MC1762  
Berkeley, CA 94720-1762

Tel: 510-666-3361  
Fax: 510.642.5835  
[blthomas@berkeley.edu](mailto:blthomas@berkeley.edu)



Letter IND 63

Planning Departmental &lt;planning@berkeley.edu&gt;

## Public Comments: Upper Hearst Development Project

**Fatima Alleyne** <fatima.alleyne@berkeley.edu>

Tue, Mar 19, 2019 at 10:41 PM

To: planning@berkeley.edu

To Whom It May Concern:

My name is Fatima and I send this email because I want to express my utter concern with the campus' proposal to close Upper Hearst.

First, I would like to voice my vehement disagreement with the Planning Department's decision to hold both public hearings as far as possible from the proposed site and people most impacted. Additionally, all hearings have been in the evening, denying people with limited transportation and/or childcare needs from participating. IND 63.1

Thus, I recommend that you hold a public hearing at a location near Hearst e.g. Wozniak Lounge, Sibley Auditorium.

Second, the campus released data about food insecurity and skyrocketing housing costs. Based on the research conducted, one attributing factor was that the university has NO control over what developers charge for housing. Despite knowing this information and the challenges students and staff face in acquiring affordable housing, the campus has chosen to partner with yet another developer to "address" the housing crisis. In fact, this will only exacerbate the problem. IND 63.2

Third, how does the university plan to accommodate the hundreds of people they will displace? I have three children to pick up from three different schools in three different cities. I do not have time to drive from Richmond, past North campus to Clark Kerr (deal with that traffic, which will be an issue with an increase in cars in that direction posing traffic jams and gridlock) and then making my way back to North campus to my office. Furthermore, there are already parking constraints at both Hearst lots as staff often have to stack park after 9am. With one lot, this would be even more of a logistical nightmare and increase the hardship on so many people. IND 63.3

I hope that you will not close this lot, as it will have negative impact on the hundreds of employees who utilize the facility and the students, faculty, and other staff members we serve.

--

Fatima Alleyne, PhD  
 Director of Faculty Engagement for Equity & Inclusion, College of Engineering  
 University of California, Berkeley  
 101 Bechtel Engineering Center  
 Berkeley, CA 94720  
[fatima.alleyne@berkeley.edu](mailto:fatima.alleyne@berkeley.edu)  
 Office: (510) 664-4566  
 Email: [fatima.alleyne@berkeley.edu](mailto:fatima.alleyne@berkeley.edu)



Letter IND 64

Planning Departmental &lt;planning@berkeley.edu&gt;

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**UC Upper Hearst Development**

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**Jack PHILLIPS** <jhphillips@berkeley.edu>  
To: planning@berkeley.edu

Tue, Mar 19, 2019 at 2:31 PM

Ladies & Gentlemen:

I have owned the property at [1774/1776 Le Roy Avenue](#) for over 30 years, and have taught at UC Berkeley continuously during this period. I am deeply concerned with the beauty of our neighborhood, and received an award from BAHA for the restoration of the property.

The continuing need for campus expansion cannot be denied, and I am in support of it.

I cannot, however, support the current plans for the Goldman School expansion.

The buildings proposed are COMPLETELY out of scale with the surroundings, and should be substantially reduced, both in height and footprint.

Furthermore, quite amazingly, the design of the structures shows ABSOLUTELY NO APPRECIATION OF OR RESPECT FOR THE UNIQUELY VALUABLE ARCHITECTURAL CHARACTER OF THE NEIGHBORHOOD. Why not use the Haas School of Business campus (excluding the latest addition) or even the Foothill dorm as inspiration? We don't need another soulless metal and glass box.

I ask you to completely reconsider this project, and to create something beautiful, appropriate, and effective for this critical site.

Thank you for your consideration,

John H. Phillips  
[1776 Le Roy Avenue](#)  
[Berkeley, CA 94709](#)

IND  
64.1



Letter IND 65

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Development comments

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**Michael L. Anderson** <mlanderson@berkeley.edu>

Tue, Mar 19, 2019 at 1:00 PM

To: planning@berkeley.edu

As an EV owner and cyclist, I support this project. More generally, I support the university's goal to convert low-value land use (parking, in this case) to higher-value uses such as academic facilities and residential housing.

IND  
65.1

Sincerely,  
Michael Anderson

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Michael L. Anderson  
Associate Professor, Department of Agricultural and Resource Economics  
University of California, Berkeley  
<https://are.berkeley.edu/~mlanderson>

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**Public Comments: Upper Hearst Development Project.**

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**Reza Alam** <reza.alam@berkeley.edu>  
To: planning@berkeley.edu

Tue, Mar 19, 2019 at 12:39 PM

Dear Sir/Madam,

1- I counted the number of free spots on foothill lot around noon time on Wednesday and Thursday last week, and it was "30" not 100-125 that is claimed.

Please see photos attached. It was almost full.

2- I have missed lectures because of not finding parking spot. Called Parking and transportation several times. Providing parking near the work space and classes is a responsibility of the university. If faculties must be shuttled to classrooms, then we must include an extra half an hour to our schedule to be able to arrive on time in the class. Who is paying for this extra half an hour? Why should we spend this extra half of hour waiting for the shuttle/sitting in the shuttle?

3- It is on average 20 min for commute from other parkings to buildings, round trip 40 minutes a day, for 300 people it becomes 200 professor-hour a day. Regular average hourly rate (not consulting rate)~ 75\$. That adds up to be \$5.4M/year time of faculties wasted.

4- The general rule is that parkings must be close to office spaces but residential units do not need to be close or even be on campus. It is very uncomfortable if people have to park and then being shuttled to their offices. Professors have to wait in shuttle stop for up to 20 minutes in days, including potentially under storm or hot days. It looks very bad to our visitors, and our prospective faculties.

5- In which other university in the world professors need to shuttle to from parking to classrooms and offices? MIT is in a much denser city (in terms of spaces), but still campus manages to provide parking spots for every faculty within very short walking distance from their offices. This proposed idea seems so un-academic that professors from other universities will ridicule us.

We are already in a very bad situation for parking spots on campus. As I said faculties have missed lectures because of not finding a parking spot. This is making the situation much worse.

Best  
Reza Alam  
UC Berkeley

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**2 attachments**

**IMG\_1077.JPG**  
4988K

**IMG\_1085.JPG**  
4593K





Letter IND 67

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Parking Garage Demolition

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**Steven N. EVANS** <evans@stat.berkeley.edu>  
Reply-To: evans@stat.berkeley.edu  
To: Planning Departmental <planning@berkeley.edu>

Tue, Mar 19, 2019 at 11:42 AM

Dear Mr Breines,

I am a professor in both Statistics and Mathematics with an office in Evans Hall. I am writing to voice my concerns over the planned demolition of the Upper Hearst parking garage. It appears that while construction is in progress that the parking spaces which are being taken out of action will not be replaced by a comparable number of new spaces elsewhere on campus, despite the fact that the other lots on campus currently operate at or near their capacity. Personally, it is essential that I have dependable access to parking near campus in order for me to fulfill the demands of my job. I live in Moraga and must commute daily by car to campus because it is not feasible to use public transportation from where I live. I hope that campus will reconsider the decision to demolish the parking garage without guaranteeing a comparable number of new spaces elsewhere.

IND 67.1

Many thanks,  
Steven Evans

--

Steven N. Evans  
Professor of Statistics and Mathematics

Department of Statistics #3860  
University of California at Berkeley  
367 Evans Hall  
Berkeley, CA 94720-3860  
USA

url: <http://www.stat.berkeley.edu/users/evans>



Letter IND 68

Planning Departmental &lt;planning@berkeley.edu&gt;

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**propose upper hearst demo**

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**Jennifer Teverbaugh** <jennifert@berkeley.edu>

Wed, Mar 20, 2019 at 8:51 AM

To: planning@berkeley.edu

Hello,

I am a staff member and park in the upper Hearst lot every morning for work. With this lot being demolished, staff and faculty will lose 300+ F & C permit parking spaces, even after the replacement structure is in place. This plan not only will decrease parking around this area, but will also have a negative impact on traffic around the Hearst/Gayley intersection which is already congested .

IND  
68.1

I'd like to voice my opposition against the upper Hearst parking structure demolition.

Jennifer

--

Jennifer Teverbaugh  
Hearst Mining Building Manager, COE Dean's Office  
Computer/Facilities Support, Department of Bioengineering  
298 Hearst Mining Building  
University of California, Berkeley  
Phone: (510) 643-1582

Office hours: 7:30am - 4:00pm Monday - Thursday



## SEIR around People's Park

**beneficialbug@sonic.net** <beneficialbug@sonic.net>  
 To: planning@berkeley.edu

Wed, Mar 20, 2019 at 7:26 PM

### SEIR response

**To whom it should concern:**

**emailed 3/20/19**

People's Park should be free of more threats to build upon it for many reasons:

- It is a green space in a dense urban area
- It has huge historical significance as a User-developed park, a model of this for people around the world
- It was created after UC razed sturdy homes which were homes to a diversity of people: families, students, activists
- We have proven over years that, people want this park to remain as it is, a User-developed park
- It provides a gentler place for people to land when they are further disenfranchised with each spike in rents and general costs in the Bay Area
- Many volunteers provide food, dry socks, and toiletries to people who sometimes have trouble attaining such basics
- When the Free Box is left alone, people can get clothing there
- It is a place where people can live with dignity when they are not being harassed by UC or cops
- It is a place where people who have no other housing are welcome
- It is a place where students and their parents are welcome
- It is a place where neighbors are welcome
- It is a place where tourists are welcome
- Two people were killed at or around the issue of the park, and hundreds were shot and harmed, another sexually harassed by a UC cop when under arrest for demanding that the volleyball court be removed. If for no other reason than to honor this as sacred ground, the park must be left to thrive in User-development
- Thousands enjoy the park every year as an oasis of green and a place where creativity shows itself in the many kinds of celebrations, and in the everyday actions of people enjoying People's Park
- People's Park has been a place where anyone can garden and add to good and productivity in the world, even if they may not be able to hold down a job for money
- People's Park was born of anger and rebellion against the deception of UC in causing good homes and all manner of resources to be wasted, and people to lose their homes

IND  
69.1

- We understand that UC has a goal of sanitizing the area around the university to make it appealing to suburban parents who send their kids to a corporate finishing school called UC. As a former UC student and longtime supporter of People's Park, I object to this attitude

- Need for UC to develop more housing is deception. UC wants this as another money-maker. The city needs to step up and have more housing developed but NOT at market rate or even "affordable" units which my family never could have afforded. It needs to include housing including for "low income", "very low income", and "very very low income" units

- UC has impinged on the longtime residents of Berkeley by bringing in many more students than were in the long-range plans; yet, students already in Berkeley cannot even assume they will have entrance if they are not out-of-the-ballpark stellar, and cannot even if they appear to fit THAT bill!

- UC takes far, far more than it "gives" longtime residents of Berkeley, people who have a loyalty to this city. Basically, we're treated as detritus by the university and many of us have been pushed out of living in the city we helped create. The 17-1/2 years my children and I slept in San Leandro, though our lives in many way remained focused here, were related to the unfairness of UC pulling in more students than reasonable, and the city also letting greedy housing developers do what they want. Something has to change. At least some people have been able to remain in Berkeley even if rents made an apartment not a possibility for them

UC is so far out of line, and the downing of some 42 healthy trees (no, they were not dangerous) is a last straw. Is UC looking for revolts like they've seen over decades around the park? As we plan our 50th anniversary we've been hearing vows of showing up to defend once more. People have a loyalty to the park they've helped develop, and neighbors understand the importance of the park in being a place which allows everyone to use the park, not just some chosen few who might rent dorm spaces for what? If it was \$12,000/ year when my nephew was in dorms a decade ago, much higher than nicer apartments (not including summer or other holiday times), I can only imagine how much profits UC is making in 2019. It's all about money, and trying to convince students they should think only SO far, not freely and broadly. People's Park is a threat, therefore, to those who would like to control a status quo which enriches a few, at the expense of many.

Hands off People's Park!

Sincerely,

Maxina Ventura

Berkeley, 94703

--

Maxina Ventura  
Classical Homeopathy for the Whole Family  
WiseWomanHealth.com

IND  
69.1



Letter IND 70

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Lower/Upper Hearst

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**Christopher O'Dea** <codea@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Wed, Mar 20, 2019 at 4:18 PM

I'd like to submit a concern/comment about the demolition of Upper Hearst Parking:

-- Is the University expanding Perimeter/Central Campus Shuttle service due to the removing of all these parking spaces high up on Hearst/hill? Current shuttle service in morning/day/eve hours is limited to every 15-20min. Often LBL shuttles have 4-8 times as many shuttles running up the same route. With the closure of Upper Hearst employees, students and staff will need to rely on BART and the Central/Perimeter shuttle, which is quite limited. This shuttle needs to be every 10min to make it more appropriate for the demands of the university.

IND  
70.1

thanks  
Chris

--  
**Director of Production**  
Documentary & Production Lab  
mobile 415-310-4342  
direct 510-643-0594  
[Journalism.berkeley.edu/donate/](http://Journalism.berkeley.edu/donate/)





Letter IND 71

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst demolition

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**Peter** <peterh@berkeley.edu>  
To: planning@berkeley.edu

Wed, Mar 20, 2019 at 6:16 AM

Dear Planning department.

I would love to participate in the public hearing about the upper Hearst demolition and construction. However, due to child care and family obligations i cannot participate at this time. I find it very unfortunate that working parents are excluded from this event due to the time of the event.

I therefore urge you to have an event during normal work hours so working parents can participate or meet with me individually so i can voice my concerns.

Also, is this event going to be recorded so i can watch this later or from home?

Best regards

peter

--

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Dr. Peter Hosemann

Professor and Department Chair  
Department of Nuclear Engineering  
University of California Berkeley  
4151 Etcheverry Hall  
Berkeley, CA, 94720

Lawrence Berkeley National Laboratory (LBNL)  
Faculty Scientist  
Material Science Division

Nuclear Materials Group:  
<http://materials.nuc.berkeley.edu/>

Phone: (c) 510 717 5752  
[peterh@berkeley.edu](mailto:peterh@berkeley.edu)

IND  
71.1



Letter IND 72

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comment: Upper Hearst Development Project**

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**Sabreen Abdelrahman** <sabreen@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Wed, Mar 20, 2019 at 2:46 PM

Dear UC Berkeley Capital Strategies,

My name is Sabreen, I am an undergraduate student at UC Berkeley, and I am writing to provide comment on the draft supplemental EIR.

The UC Berkeley campus has grown by 9000 students more than the expected amount outlined in the Long Range Development Plan, but housing development and emergency services have not kept pace. Due to this, students have been forced to live further from campus or are left to live in their cars or couch surf. The campus must build more student housing, not only because of its responsibility to the students but also because of its responsibility to the city and its role in exacerbating gentrification.



IND 72.1

Additionally, our students have a right to a safe campus community. We need more accessible emergency services and safer, walkable nighttime environments. We also need another ambulance for the city, especially in light of the potential closure of Alta Bates.

IND 72.2

Finally, there are a number of environmental concerns given the lack of resources to keep up with enrollment growth. With a lack of housing there is a promotion of vehicle use. We need increased transportation options — bus improvements and bike lanes are essential to a green lifestyle. We need to electrify campus, reduce waste and emissions, and go carbon neutral. The campus must do more to offset the harms of enrollment growth.

IND 72.3

Thank you,  
Sabreen Abdelrahman



Letter IND 73

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Enrollment Growth testament (emphasis on campus security)**

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**Samantha Kerns** <samanthajkerns@berkeley.edu>

Wed, Mar 20, 2019 at 12:58 PM

To: planning@berkeley.edu

Dear UC Berkeley Capital Strategies,

My name is Samantha Kerns, I am a freshman undergraduate student at UC Berkeley, and I am writing to provide comment on the draft supplemental EIR.

The UC Berkeley campus has grown by 9,000 students more than the expected amount outlined in the Long Range Development Plan, but housing development and emergency services have not kept pace. Due to this, students have been forced to live further from campus or are left to live in their cars or couch surf. The campus must build more student housing, not only because of its responsibility to the students but also because of its responsibility to the city and its role in exacerbating gentrification.

Additionally, our students have a right to a safe campus community. We need more accessible emergency services and safer, walkable nighttime environments. We also need another ambulance for the city, especially in light of the potential closure of Alta Bates.

I have had personal experiences of fear around campus. I live in Clark Kerr and it is extremely unsafe to walk around the campus at night and there have been so many incidents within the dorm campus alone. I should not have to feel terrified to walk from the study room to my building or have to stay up with my friend late while she is crying because she was chased walking from one building to another.

Finally, there are a number of environmental concerns given the lack of resources to keep up with enrollment growth. With a lack of housing, there is a promotion of vehicle use. We need increased transportation options — bus improvements and bike lanes are essential to a green lifestyle. We need to electrify campus, reduce waste and emissions, and go carbon neutral. The campus must do more to offset the harms of enrollment growth.

Thank you,  
Samantha Kerns

IND 73.1



Letter IND 74

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comment: Upper Hearst Development Project**

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**Sarah Bancroft** <sbancroft@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Wed, Mar 20, 2019 at 11:35 PM

Dear UC Berkeley Capital Strategies,

My name is Sarah Bancroft and I am a current sophomore at UC Berkeley. I am writing to provide comment on the draft supplemental EIR.

As an undergraduate, I have seen and experienced firsthand the detrimental effects of the lack of available student housing for UC Berkeley students. Searching for off-campus housing is an added burden on already stressful lives of Berkeley students, particularly low-income students. The university cannot in good conscience continue to accept thousands more students on campus without providing adequate housing opportunities for them. Without affordable student housing, we are being forced to look farther and farther off campus to find reasonably priced units, which can create dangerous situations for commuting to and from campus at night. The campus must build more student housing, not only because of its responsibility to the students but also because of its responsibility to the city and its role in exacerbating gentrification.

Additionally, our students have a right to a safe campus community. We need more accessible emergency services and safer, walkable nighttime environments. We also need another ambulance for the city, especially in light of the potential closure of Alta Bates.

Finally, there are a number of environmental concerns given the lack of resources to keep up with enrollment growth. With a lack of housing there is a promotion of vehicle use. We need increased transportation options — bus improvements and bike lanes are essential to a green lifestyle. We need to electrify campus, reduce waste and emissions, and go carbon neutral. The campus must do more to offset the harms of enrollment growth.

Thank you,  
Sarah Bancroft

IND  
74.1



Letter IND 75

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Draft Supplemental EIR**

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**Vanya Srivastava** <1ya\_13@berkeley.edu>

Wed, Mar 20, 2019 at 11:13 AM

To: planning@berkeley.edu

Dear UC Berkeley Capital Strategies,

My name is Vanya Srivastava, I am an undergraduate student at UC Berkeley, and I am writing to provide comment on the draft supplemental EIR.

The UC Berkeley campus has grown by 9000 students more than the expected amount outlined in the Long Range Development Plan, but housing development and emergency services have not kept pace. Due to this, students have been forced to live further from campus or are left to live in their cars or couch surf. The campus must build more student housing, not only because of its responsibility to the students but also because of its responsibility to the city and its role in exacerbating gentrification.

Additionally, our students have a right to a safe campus community. We need more accessible emergency services and safer, walkable nighttime environments. We also need another ambulance for the city, especially in light of the potential closure of Alta Bates.

Finally, there are a number of environmental concerns given the lack of resources to keep up with enrollment growth. With a lack of housing there is a promotion of vehicle use. We need increased transportation options — bus improvements and bike lanes are essential to a green lifestyle. We need to electrify campus, reduce waste and emissions, and go carbon neutral. The campus must do more to offset the harms of enrollment growth.

Thank you,  
Vanya Srivastava

—

B.A. Architecture || Class of 2022  
University of California, Berkeley  
[1ya\\_13@berkeley.edu](mailto:1ya_13@berkeley.edu)  
(510)-666-7085

IND  
75.1



March 21, 2019

Vini Bhargava, PMP, LEED AP  
Director, Physical and Environmental Planning  
University of California Berkeley (UCB)  
Berkeley, California 94720-1382

Re: Draft Supplemental EIR (SEIR), 2020 LRDP/Upper Hearst Development &  
Minor Amendment to 2020 LRDP

Dear Ms. Bhargava:

While this SEIR claims to be accountable for an analysis regarding UCB's increased student enrollment, it actually seems apparent that a main objective of this SEIR is to obfuscate full disclosure, discussion, and/or detailed information regarding UCB's increased and intention-to-increase its student enrollment since the 2020 LRDP. Such obfuscation begs "foul play." Indeed, this SEIR informs the public about a proposed massive and significant Upper Hearst Development Project — including a proposal to build sizable off campus accommodations for academic teaching and conference-auditorium facilities, off campus parking facilities, and a massive off campus housing complex. But, the public is left without detailed information and/or discussion about the scope of a so-called "minor" amendment to the 2020 LRDP i.e. UCB's increased student enrollment and the potential and various significant effects upon the community-at-large.

IND 76.1

Citing the "Executive Summary," page 2 of the SEIR, claim is made that the rationale for UCB's entitlement for an increase in student enrollment might be simply to "...accommodate the proposed housing land use on the Project site" i.e. the Upper Hearst Development Project site.

- So, in fact, how is this SEIR compliant with the purposes of the California Environmental Quality Act (CEQA) when its discussion of significant student enrollment is merely assumed and submerged within the discussion of UCB's project analysis for the Upper Hearst Development Project, rather than acknowledging that a significant change of student enrollment has already occurred since the 2020 LRDP, and may still be intended to be increased?
- How is it compliant with CEQA that the citizens of Berkeley, and the City's government, all together, do not have a full and adequate environmental

IND 76.2

review of UCB's increase and projected increase of student enrollment so as to understand, to question, and to fully discuss within the context of a separate EIR all potential economic, operational, and environmental impacts? ↑

Thank you for your attention and consideration.

Sincerely.

  
Lesley Emmington

Draft Supplemental EIR to the  
2020 Long Range Development Plan  
Environmental Impact Report

**CEQA Public Hearing**

March 21, 2019

**Your Info:** *Please print legibly.*

\_\_\_\_\_  
Name *Lynn Cerda-Price*

\_\_\_\_\_  
Email *lcerda-price@berkeley.edu*

\_\_\_\_\_  
Address

**Comment Options for Public Record: TONIGHT**

**1. Oral**

Submit this card to the check-in table to make oral comments at tonight's hearing.

Each oral comment is limited to a maximum of **two** minutes.

**2. Written**

Use the space on the back of this card to provide written comments. Submit the completed card to the check-in table.

**Comment Options for Public Record: ADDITIONAL**

**1. Email**

Send comments to [planning@berkeley.edu](mailto:planning@berkeley.edu).

**2. Mail**

Send comments to: Physical and Environmental Planning  
University of California, Berkeley  
300 A&E Building, Berkeley, CA 94720-1382

**Subject:**

in favor of new building  
for Goldman School

IND 77.1

**Comment:**

no space for our  
students to work or  
to study

not enough classroom  
space

not enough space for  
faculty

no space for lecturers

provides housing  
for faculty, grad  
students

remove unsightly parking  
structure and replace  
with other parking





Letter IND 78

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comment: Upper Hearst Development Project**

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**Natasha Ham** <natashaham@berkeley.edu>  
To: planning@berkeley.edu

Thu, Mar 21, 2019 at 5:21 PM

Dear UC Berkeley Capital Strategies,

My name is Natasha Ham, I am an undergraduate student at UC Berkeley, and I am writing to provide comment on the draft supplemental EIR.

The UC Berkeley campus has grown by 9000 students more than the expected amount outlined in the Long Range Development Plan, but housing development and emergency services have not kept pace. Due to this, students have been forced to live further from campus or are left to live in their cars or couch surf. The campus must build more student housing, not only because of its responsibility to the students but also because of its responsibility to the city and its role in exacerbating gentrification.

Additionally, our students have a right to a safe campus community. We need more accessible emergency services and safer, walkable nighttime environments. We also need another ambulance for the city, especially in light of the potential closure of Alta Bates.

Finally, there are a number of environmental concerns given the lack of resources to keep up with enrollment growth. With a lack of housing there is a promotion of vehicle use. We need increased transportation options — bus improvements and bike lanes are essential to a green lifestyle. We need to electrify campus, reduce waste and emissions, and go carbon neutral. The campus must do more to offset the harms of enrollment growth.

IND  
78.1

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**Public Comment: Upper Hearst Development Project**

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**Neil McClintick** <neil.mcclintick@berkeley.edu>

Thu, Mar 21, 2019 at 5:39 PM

To: planning@berkeley.edu

My name is Neil, I am an undergraduate student at UC Berkeley, and I am writing to provide comment on the draft supplemental EIR.

The UC Berkeley campus has grown by 9000 students more than the expected amount outlined in the Long Range Development Plan, but housing development and emergency services have not kept pace. Due to this, students have been forced to live further from campus or are left to live in their cars or couch surf. The campus must build more student housing, not only because of its responsibility to the students but also because of its responsibility to the city and its role in exacerbating gentrification.

Additionally, our students have a right to a safe campus community. We need more accessible emergency services and safer, walkable nighttime environments. We also need another ambulance for the city, especially in light of the potential closure of Alta Bates.

Finally, there are a number of environmental concerns given the lack of resources to keep up with enrollment growth. With a lack of housing there is a promotion of vehicle use. We need increased transportation options—bus improvements and bike lanes are essential to a green lifestyle. We need to electrify campus, reduce waste and emissions, and go carbon neutral. The campus must do more to offset the harms of enrollment growth.

Thank you  
Neil McClintick

--

**Neil McClintick**

Transfer Student Director, ASUC Office of the President

Fund the UC Campaign Manager, ASUC EAVP

[Associated Students of the University of California](#)

Class of 2019, University of California, Berkeley

IND  
79.1



Letter IND 80

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comment: Upper Hearst Development**

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**Timothy Etter** <timothy.l.etter@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Thu, Mar 21, 2019 at 7:01 PM

Dear UC Berkeley Capital Strategies,

My name is Timothy Etter, I am an undergraduate student at UC Berkeley, and I am writing to provide comment on the draft supplemental EIR.

The UC Berkeley campus has grown by 9000 students more than the expected amount outlined in the Long Range Development Plan, but housing development and emergency services have not kept pace. Due to this, students have been forced to live further from campus or are left to live in their cars or couch surf. The campus must build more student housing, not only because of its responsibility to the students but also because of its responsibility to the city and its role in exacerbating gentrification.

Additionally, our students have a right to a safe campus community. We need more accessible emergency services and safer, walkable nighttime environments. We also need another ambulance for the city, especially in light of the potential closure of Alta Bates.

Finally, there are a number of environmental concerns given the lack of resources to keep up with enrollment growth. With a lack of housing there is a promotion of vehicle use. We need increased transportation options — bus improvements and bike lanes are essential to a green lifestyle. We need to electrify campus, reduce waste and emissions, and go carbon neutral. The campus must do more to offset the harms of enrollment growth.

Thank you,

Timothy Etter

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Class of 2021

IND  
80.1



Letter IND 81

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Parking Structure

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**Brian Perlman** <brianperlman@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Thu, Mar 21, 2019 at 5:21 PM

Dear Berkeley Planning,

Where in the heck do you expect people to park if you demolish the upper Hearst parking structure? Street parking is already extremely hard to come by, and this will exacerbate the issue. Sometimes I have to drive around the Hearst Av. area for 20 mins to find a spot on the street. If the parking structure goes away, people will have to resort to street parking, and Berkeley isn't building any more streets. So what is your plan?

Please let me know. You will have a huge parking nightmare if you demolish the structure! You're putting students at a huge disadvantage without any alternative.

Thanks,  
Brian Perlman  
Grad Student, UC Berkeley '20

IND  
81.1



## Upper Hearst demolition

Peter <peterh@berkeley.edu>

Fri, Mar 22, 2019 at 4:38 AM

To: UC Berkeley Planning <planning@berkeley.edu>

Ok great thank you. Where can i find the links to these recordings? Please send me the link to them.

Thank you!

It is simply outrageous that we take away the ability to work at UCB for hundreds of our faculty and staff to benefit a very limited number of faculty and a single small department. I am sure the planing department will find that the cost /benefit analysis does not warrant this structure to be build in its current form.

### Here are my questions i would like to have answered :

- 1) How is the inequality addressed since lower income employees (staff, assistant professors, graduate students) are going to be carrying the main load of this project. Lower income staff have to live further away from campus and not at public transportation routes. More than 300 people who do not have the luxury to live near campus are severely impacted by this new structure. Are we going to be compensated for it and if so how?
- 2) Is it the planing departments new policy to be discriminatory against lower income personnel? If not why is the planing department the only viable option of commuting from affordable areas away from employees to benefit a single school and a limited number of employees?
- 3) Is it the planing departments new policy to reduce student contact hours with faculty and staff and decrease laboratory safety? The result of not beeing able to park on or near the labs and work areas will be that people will spend less time on campus. If the campus tries to create more unused space and reduce the contact hours with students this is a good way to do it.
- 4) How are people who work part time at Richmond field station or other off campus areas supposed to go back and forth? A ones an hour bus is unreasonable on an 8h work day since one trip (back and forth) would account for 25% of the work day. Did the planing department account for the lost time in these cases.
- 5) How does this project address student housing, faculty housing, staff housing and the housing crisis we are facing today? If the housing is not at below market rate and reserved for students, post docs or faculty then there is no benefit of this project towards housing and the only beneficiaries re the GSPP members who get a new office.
- 6) Is it true that GSPP faculty will get reserved parking in this new structure? If this is the case why are they treated better than everyone else? Why are there privileges given to those faculty and the rest of us does not get the same privileges?
- 7) The simple fact that the company requires you to provide parking for the units built tells you that parking is very important. Why are these residence getting special treatment compared to the rest of the campus community. Or are these apartments meant for noble laureates only?
- 8) How are donors and other officials dealt with? Are you considering having donors and other officials walk to the COE from some undefined parking area? Does the planing department really think that this will help in fund raising?
- 9) Why were the values of the parking spots 50k/parking spots not taken into account while all other structures must consider that.
- 10) Did the planing department take the costs of the retention cases into account that will result from this? If you take away teh means of transportation you take away the ability to work and people will leave campus unless they are compensated for the higher cost they have to bare. If so at what level was this assessed (dollar amount please)?
- 11) Have other locations for the GSPP been considered? What other locations were considered for GSPP?
- 12) Why has the parking lot on Ridge and Euclid not being considered? Building a building ontop of that parking lot will only increase parking availability if a second floor is added.
- 13) Why was a rebuild of the existing slot of GSPP not considered ?

IND 82.1

3/22/2019

UC Berkeley Mail - Upper Hearst demolition

Thank you for considering my concerns.

Best regards

Peter

[Quoted text hidden]

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**Comments: Upper Hearst Development Project**

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**Charlene Woodcock** <charlene@woodynet.net>

Sat, Mar 23, 2019 at 9:21 PM

To: planning@berkeley.edu

Cc: chancellor@berkeley.edu, "J M Sharp itsa@lmi.net [Northside-NA]" &lt;Northside-NA@yahoogroups.com&gt;, Berkeley Mayor's Office &lt;mayor@cityofberkeley.info&gt;, Berkeley City Council &lt;council@cityofberkeley.info&gt;, bnc50@berkeleyneighborhoodscouncil.com, Sustainable Berkeley Coalition &lt;sustainable-berkeley-coalition@googlegroups.com&gt;, Elizabeth Neoman &lt;eneoman@dailycal.org&gt;

Raphael Breines, Senior Planner

Physical &amp; Environmental Planning

300 A&E Building  
UC Berkeley  
Berkeley, CA 94720-1382

Re: Draft Supplemental EIR, 2020 LRDP/Upper Hearst Development

Dear Mr. Breines:

As a Northside neighbor to the University, I have watched with concern the gradual incorporation over the years of ever more private properties into the University's control. University administrators' willingness to cut trees and to thrust ugly and over-sized buildings into the relatively fragile Northside residential neighborhood has not made it a friendly neighbor. The cutting of many mature trees along Ridge Road and LeRoy Avenue to build a tech lab was a low point. The University should be at the forefront of climate change cause-and-effect and not be overseeing destruction of carbon-storing trees on its property, as it continues to do.

In the case of the Upper Hearst Development, it's a question of whether the designers can convert the existing use of space for parking into a space for housing and academic use that fits more gracefully into the neighborhood than the concrete brutalist parking structure it will replace. There seems to be a clear consensus that the original 6-level plan fails to do so, both in scale and aesthetically, and should be abandoned. This steep area, already overloaded with university traffic every day, cannot absorb the hundreds more inhabitants this plan proposes.

IND 83.1

However, the Reduced Scale Alternative, with the residential building reduced from six to four stories and the academic building from four to three stories, seems to be a solution all can live with. That assumes that the architecture would be sensitive to and comport well with existing neighborhood buildings. I urge you to commit to the Reduced Scale Alternative.

Of more broad concern is the failure of the University to meet its own housing goals, at the same time as it has increased enrollment well beyond the limits of its Long Range Development Plan (33,450 in 2020—a number it exceeded years ago). This has placed the burden of providing housing for students upon the city of Berkeley, and done so during a period of out-of-control private investment in housing which has driven residential housing costs far beyond what students and residents of Berkeley can afford. The result is that long-term Berkeley renters, having to compete with ever more students, are being squeezed out; and students are left without stable living conditions and even reduced to living in cars. This is unacceptable.

IND 83.2

It seems clear that enrollment at UCB must be frozen until its own housing goals are met. The university has several available sites for student housing, including the site of the former UC Extension building at Oxford and Bancroft, some part of the People's Park site, the site at University and Oxford Avenues once frivolously considered for a hotel. I urge you to take into consideration not just the university's immediate needs for space and housing, an effort to catch up for failed provision in past decades, but the ongoing relationship with the neighborhood into which this site protrudes and, most especially, the most responsible planning in view of climate disruption, which should be at the forefront of all our concerns.

IND 83.3

Sincerely,

Charlene M. Woodcock

A-609

3/25/2019

UC Berkeley Mail - Comments: Upper Hearst Development Project

[2355 Virginia Street](#)

[Berkeley 94709](#)



Letter IND 84

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Proposed Upper Hearst Development

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**Lisa Titus** <titusmcdonnell@gmail.com>  
To: planning@berkeley.edu

Sat, Mar 23, 2019 at 5:52 PM

Dear Planning Commission,

Although I support additional student and faculty housing and have no objections to an expansion of the Goldman School, the proposed project is too large and very poorly designed.

As you know, the proposed project includes a large new academic building on Hearst Avenue and a massive apartment building at the corner of La Loma Avenue and Ridge Road that would be 5 to 6 stories (72 feet) high and of a totally inappropriate design for this historic neighborhood. I live in an historic home at 1705 La Loma, just a few steps from this proposed project. It would alter our neighborhood for the worse, and impinge not only on the aesthetics, but the inherent value of my property. This last point should be a point of interest, as neighbors have worked hard to maintain and increase the value of their homes. To see them limited or decrease in value due to the UC could be possibly litigious.

I do want to support the growth of the UC, however, so I would like to throw my support behind the reduced scale alternative, with the academic portion three stories in height and the residential building four stories total. I would ask that a major re-think be done with regard to the style of architecture. The Goldman Public Policy Building is tasteful and in keeping with the local vernacular. I don't see why something similar can't be done.

This is not a rush project, so please take your time -- measure twice and cut once.

Sincerely,

Lisa Titus  
[1705 La Loma Ave](#)  
[Berkeley, CA 94709](#)

IND  
84.1



Letter IND 85

Planning Departmental &lt;planning@berkeley.edu&gt;

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**demolition of Upper Hearst parking lot**

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**Marc Rieffel** <rieffel@berkeley.edu>

Sat, Mar 23, 2019 at 8:59 PM

To: planning@berkeley.edu

As a long-time faculty member I have parked many years in the Upper Hearst parking lot. I am very concerned that demolition of that parking lot would add significant time to my commute (and that of many others) to the campus. I already work quite long hours for the university, so any increase in commuting time would result in less time I could give to my university service. One consequence is that I and others would probably need to reduce the number of days that we come to the campus, with resulting decrease in the quality of the education that our campus provides.

IND  
85.1

I could take public transportation, but when I have tried that it added at least 30 minutes each way to my commute time, thus reducing by at least an hour per day the amount of time I could spend on my university service. This is very significant.

An added concern is that some very valued members of my department staff park in the Upper Hearst lot, and have told me that, in part because they have significantly longer commutes to campus than I do, if their commute is significantly lengthened they would probably need to leave their university employment because of their family obligations.

In short, if the Upper Hearst lot is to be demolished, it is essential the before that is done an equivalent amount of very close-by parking be provided so that the commute time of faculty and staff members is not significantly lengthened. (Already finding parking after about 9 AM can be quite challenging.)

I must admit that I have recently begun feeling the the campus is getting seriously strangled by the increasing cost of living in the area, the increasing number of students, the decreasing budgets, and the decrease in such necessities as parking. My department is certainly having serious difficulties attracting top young faculty members because of these increasing problems.

Marc A. Rieffel  
Professor of Mathematics  
March 23, 2019



Letter IND 86

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comments: Upper Hearst Development Project**

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**R. Robson** <rrobson@berkeley.edu>  
To: planning@berkeley.edu

Sat, Mar 23, 2019 at 9:50 PM

To whom it may concern —

I am a UC Berkeley student concerned about language in the Draft SEIR regarding potential housing projects. While the People's Park site has been proposed by the Chancellor's Office, I question the efficacy of listing it as a "foreseeable" project. The People's Park site, should the university decide to move forward on it, would require its own review process that I do not believe it could legitimately pass.

I feel that the current level of information in the Draft SEIR on the housing development sites, which would likely be built through private-partnerships, is lacking in detail as compared to the other projects listed as proposed/foreseeable. The Draft SEIR says that the university has identified "several potential housing locations," yet lists 7 locations. There is a *significant* difference in impact on the Berkeley community if the university should build on 1 versus 7 of these sites, an impact which is highly relevant to understanding the cumulative impact of UC development including the Upper Hearst project. The impact of destroying People's Park on the community is substantially different than the impact of Unit 3 infill. I do not find these projects to be comparable, nor their information to be sufficient.

Sincerely,  
R. Robson

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Letter IND 87

Planning Departmental &lt;planning@berkeley.edu&gt;

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**objection to demolition of the upper Hearst garage**

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**Edward Frenkel** <frenkel@math.berkeley.edu>

Wed, Mar 27, 2019 at 5:52 PM

To: planning@berkeley.edu

Hello -- I am writing to voice my strong objection to the demolition of the upper Hearst garage. I am a Professor at the Department of Mathematics, and I have been using this garage for over 20 years. As far as I know, no viable alternative is being proposed. Demolition of this garage will therefore place an unfair and undue burden on me and my colleagues who work in the vicinity of this garage. We have been good citizens, paying thousands of dollars to the University for our parking permits for many years. If this project goes ahead, we will have no place to park in the neighborhood of our work space. This is not right.

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I hope you will reconsider this project.

Thank you,

Edward Frenkel  
Professor  
Dept of Mathematics  
UC Berkeley





Letter IND 88

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comments: Upper Hearst Development Project**1 message

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**Jordan Burns** <jordanphillipburns@berkeley.edu>  
To: planning@berkeley.edu

Thu, Mar 28, 2019 at 2:35 PM

Hello,

I fully support the demolition of the parking structure to build new housing and academic buildings. People should be using public transportation to get to campus, not driving. We also sorely need new academic space and housing for everyone, faculty included. Please put me on the record for fully supporting this project.

IND  
88.1

Jordan Burns



Letter IND 89

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comments: Upper Hearst Development Project**

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**Kelly Kmak** <knkmak@berkeley.edu>

Thu, Mar 28, 2019 at 3:46 PM

To: Planning Departmental &lt;planning@berkeley.edu&gt;

Hello,

I am replying to the atrocious plan to remove parking the Upper Hearst Parking garage.

Eliminating parking will make it harder for those who cannot afford the high cost of living in Berkeley to work on campus or attend classes. There is not readily accessible, reliable public transportation all over the Bay Area to provide access to campus for all students, postdocs and staff who cannot afford to live in Berkeley and therefore some rely on this parking garage to be able to get to campus on a regular basis.

In addition, GSPP serves a very small percentage of students on campus, and tearing down this parking structure to provide academic space for them would have no benefit to the student body at large and actually do a disservice to the average student by making it harder for visiting scholars and guest lectures to get to campus as well as making it harder for students to access campus.

Creating at or near market rate housing is an absolutely horrendous misuse of university funds. There is sufficient market rate housing in Berkeley for faculty and those who are paid at a reasonable level. It is students and postdocs who have a severe need for below market rate housing options, the university should first be looking out for these groups, not for those who have options already.

The only conceivably justifiable reason to remove parking spaces, an invaluable lifetime for campus accessibility, would be to provide affordable housing options for students. Since this is not the plan for this development, it should not be allowed to happen as it will contribute to deepening inequality on campus.

Thank you.

Sincerely,  
Kelly Kmak

IND  
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Letter IND 90

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Parking

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**Kenneth A. RIBET** <ribet@math.berkeley.edu>

Thu, Mar 28, 2019 at 12:21 PM

Reply-To: ribet@math.berkeley.edu

To: planning@berkeley.edu

Hello Planners,

I'm writing to add my voice to those of my colleagues who have written to you about the loss of parking in the northeast corner of the campus. A member of the math department, I work in Evans Hall and drive in to campus pretty much every day. I generally park on Level 1 of the structure that is slated for demolition.

IND 90.1

Although there was a long stretch of years when I would bike in to campus most days, I gave up biking in 2013 after a minor spill led to a soft tissue shoulder injury that took months to heal. I'm old enough now that I can no longer count on picking myself off the ground after a tire blowout or an encounter with part of a motor vehicle.

AC Transit is sort of an option for me, but the busses run infrequently and leave me at the western edge of the campus, which is a 10- or 15-minute walk from Evans. Campus shuttles could in theory take me up and down the hill, but walking across campus is typically quicker. A bus commute would be much more time-consuming than my current automobile commute and would be burdensome in bad weather or if I had errands to do either on my way to campus or on my way home.

Having to park in a satellite parking lot and taking a shuttle to the main campus would also add a significant amount of time to my commute. Even driving across Gayley Road to the commercial stadium parking lot would be annoying and time-consuming.

The result of your following through with the current plan is that I would spend much less time on the campus than I do now -- I'd come in to teach and for office hours that would be on the same days as my teaching, and I'd tend otherwise to work at home unless there were an especially compelling seminar talk or meeting. While I've been a faculty member for decades and have been a big supporter of UC and of this campus, I'm not masochistic. Working at UC Berkeley has become incrementally more difficult as class sizes have increased and institutional support has eroded. The demolition of the Upper Hearst structure would add significantly to the accumulated damage.

Sincerely,  
Ken Ribet



Letter IND 91

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comments: Upper Hearst Development Project**

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**Pulkit Agrawal** <pulkitag@berkeley.edu>

Thu, Mar 28, 2019 at 3:44 PM

To: Planning Departmental &lt;planning@berkeley.edu&gt;

I am completely against demolishing the parking structure. The parking around campus is a big headache and this demolition will make this problem even worse. The only way to commute for many of us is to drive to campus. The only compromise is possible if space is used to provide housing only and only to undergraduate students at affordable rates. There should also be a plan for how to increase the parking capacity around campus to compensate for this construction.

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**Public Comments: Upper Hearst Development Project**

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**Sean Kitayama** <skitayama@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Thu, Mar 28, 2019 at 5:16 PM

To The Planning Department,

My name is Sean Kitayama, and I am currently a Ph.D. student in bioengineering (part of the College of Engineering). I am writing today to express my **support** for the demolition of the Upper Hearst parking structure, and for the expansion of GSPP and faculty housing. As space on campus is extremely limited, I believe that it makes sense for the replacement of sole-purpose parking garages/lots on university property to make room for new buildings to accommodate the growing student population that the UC system has imposed on the university. In addition, with the Bay Area being in a serious housing crisis, having university-owned faculty (and graduate student) housing is essential for the successful recruitment of talented individuals to further academic research.

With the Bay Area having a relatively robust public transit network (the BART is literally a 10-15 minute walk and AC transit has numerous connecting lines), faculty and students should reconsider their mode of transportation to the university. Overcrowding and congestion is a growing issue in Berkeley, with public infrastructure not designed to accommodate such a large number of personal vehicles. Those who drive alone to the university should look at other options and rethink their wasteful and honestly selfish decision for commuting, as we all live in a shared society and should take it upon ourselves to use shared modes of transportation.

In closing, I hope that you **continue on** with the project as planned, and hope my colleagues in the College of Engineering will seriously rethink their opposition to this plan. Just pure speculation, but I bet that there would be little resistance if the building was to directly benefit the College of Engineering (seems narrow minded, especially from my seniors in the College).

Thank you for your time.

- Sean Kitayama

**Sean Eisaku Kitayama**  
*University of California, Berkeley*  
B.S. Bioengineering, Minor in EECS & Music | 2018  
(909) 524-2968 | [skitayama@berkeley.edu](mailto:skitayama@berkeley.edu)

IND  
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Letter IND 93

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comments: Upper Hearst Development Project**

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**Maria Folgueras** <mcf26@berkeley.edu>  
To: planning@berkeley.edu

Sat, Mar 30, 2019 at 6:20 PM

Hello,

My name is Maria Folgueras, and I am a first-year Ph.D. student in the MSE Department. I fully support the Upper Hearst Development project. It will contribute to improving the Berkeley campus, and it will affirm Berkeley's commitments to constant growth, learning, and environmental awareness and activism. Thank you very much.

IND  
93.1

Sincerely,  
Maria

Maria C. Folgueras  
Ph.D. Student, Peidong Yang Group  
Materials Science and Engineering  
University of California, Berkeley  
443-841-0044 | [mcf26@berkeley.edu](mailto:mcf26@berkeley.edu)



Letter IND 94

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Parking Structure

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**Matthew Smith** <matthew20marine@berkeley.edu>

Tue, Apr 2, 2019 at 7:13 AM

To: Planning Departmental &lt;planning@berkeley.edu&gt;, Raphael Breines &lt;rbreines@berkeley.edu&gt;

Cc: Luis Hernandez &lt;luish@berkeley.edu&gt;, Robert Teague &lt;bteague@berkeley.edu&gt;

Good morning Raphael,

I wanted to touch base with you to see what, if any, impact the demolition of Upper Hearst will have on the Lower Hearst parking structure. I am a "S" permit holder and will be until May 2020. Will any of the "S" parking at Lower Hearst be reassigned? Thank you for your response to this matter.

IND  
94.1

Always Faithful,

Matthew S. Smith  
Social Work Intern, TODCO  
MSW student, UC Berkeley  
B.A. Social Welfare, UC Berkeley 2018  
707-486-5213  
[matthew20marine@berkeley.edu](mailto:matthew20marine@berkeley.edu)  
[linkedin.com/in/matthew-s-smith](https://www.linkedin.com/in/matthew-s-smith)



Berkeley Social Welfare

Celebrating **75 years**  
of social impact through  
inquiry and action



Letter IND 95

Planning Departmental &lt;planning@berkeley.edu&gt;

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**lower hearst structure**

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**Newsa Naderzad** <naderzadn@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Tue, Apr 2, 2019 at 10:59 AM

Hello!

I am writing to ask why you're demolishing the Lower Hearst Parking Structure?

Also if this goes through, where will I park because there won't be enough for all of us to park into the nearest lot.

I use hourly parking as well...

Thanks!  
Newsa

IND  
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Letter IND 96

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Upper Hearst Development project**

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**Robert Gable** <Robert.Gable@cgu.edu>

Tue, Apr 2, 2019 at 4:14 PM

To: "planning@berkeley.edu" &lt;planning@berkeley.edu&gt;

The university has not been honest about projected student enrollment. Please halt all development until you renegotiate impacts with the City of Berkeley.

IND  
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Robert Gable



Letter IND 97

Planning Departmental &lt;planning@berkeley.edu&gt;

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## EIR for Goldman School

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**Betsy Foster** <betsyfoster@mindspring.com>  
To: planning@berkeley.edu

Tue, Apr 2, 2019 at 5:06 PM

I think it is essential that the EIR for the Goldman School project be separated out from an EIR on the increase of the student population to over 44,000. The increase in the student population must be treated as a separate issue, and it does cause significant impacts on the city that should be investigated and mitigated carefully.

IND 97.1

Thank you,

Betsy Foster



Letter IND 98

Planning Departmental &lt;planning@berkeley.edu&gt;

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## UCB expanding student enrollment?

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**margots999@aol.com** <margots999@aol.com>

Tue, Apr 2, 2019 at 3:33 PM

To: planning@berkeley.edu

UCB Stated that they wish to expand enrollment by 11,000 students, but they do not talk about how many more people they will need to enroll them, staff them, teach them. There may be as many at 5,000 additional faculty and staff coming to UCB as well as the 11000 students. Berkeley need to hear how UCB plans to transport, serve and house all these additional people. And how is will affect Berkeley. And how much \$\$\$ they will pay to offset Berkeley costs.

IND 98.1

IND 98.2

Margot Smith

[1300 A Shattuck, Berkeley 94709](#)[510-486-8010](#)[margots999@aol.com](mailto:margots999@aol.com)



Letter IND 99

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Parking Garage

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**Martin D. MEEKER** <mmeeker@library.berkeley.edu>

Tue, Apr 2, 2019 at 9:20 AM

Reply-To: mmeeker@library.berkeley.edu

To: planning@berkeley.edu

Dear Berkeley Planning,

I wish to register my supreme displeasure in the plan to remove the Upper Hearst garage – and with it hundreds of parking spots. This proposal amounts to nothing less than the imposition of a major burden on the thousands of UC Berkeley employees who commute by car and thus must drive great distances to work in large part due to the cost of housing in Berkeley and close public transit connected communities.

IND 99.1

I live outside of Santa Rosa and commute with my work colleague Roger Eardley-Pryor, who lives in Santa Rosa, every day. We endure the roughly 4-hour daily commute not because we like driving but because we want to work at Berkeley and the drive is required if want to afford the homes we live in. The proposed removal of the garage means that all other garages will be severely impacted – and those garages are all already full before 9am. I usually park in the Lower Hearst garage, and this will likely be the garage that is most impacted. What are the mitigation measures in place? Will every lost spot be replaced – and replaced in a comparatively convenient location? If this is not the case, I will remain profoundly opposed to the plan that you have developed and will seek out other impacted commuters to unite against this proposal.

If this is built, the impact on my office could be extensive, as several of my colleagues live in areas beyond a reasonable public transit commute. We will endure unexpected delays and unplanned absences because of the lack of access to campus, and we may have to institute work-for-home arrangements, whether authorized to do so or not. This would have a terrible impact, then, not just on the individual employees, but the work life of a campus research center.

Please consider the burden that you are placing on employees who already sacrifice a great deal by commuting vast distances so they can continue to make important and lasting contributions to UC Berkeley.

Regards,

Martin Meeker

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Martin Meeker, Ph.D.

Charles B. Faulhaber Director

Oral History Center

The Bancroft Library

University of California

A-626



Letter IND 100

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Colin Moore** <cmoores@comcast.net>

Thu, Apr 4, 2019 at 3:39 PM

To: "planning@berkeley.edu" &lt;planning@berkeley.edu&gt;

1. I support additional academic and housing facilities if they are well designed and do not overwhelm our neighborhood.
2. The proposed project is simply too massive, too tall, and unattractive.
3. The Reduced Scale Alternative is more in keeping with the size and height of other structures in the neighborhood.
4. I therefore ask that you select the Reduced Scale Alternative and NOT The Proposed Project.
5. I ask that you improve the design of the building to make it less massive in appearance and more in keeping with the neighborhood.

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100.1

Colin Moore

2711 Virginia Street

Berkeleyt

 Please consider the environment before printing this e-mail



Letter IND 101

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Comments re: Upper Hearst Parking Lot

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**Emily Bruce** <eBruce@berkeley.edu>

Thu, Apr 4, 2019 at 10:07 PM

To: Planning Departmental &lt;planning@berkeley.edu&gt;

To: Raphael Breines, Senior Planner  
Physical & Environmental Planning  
UC Berkeley  
300 A&E Building  
Berkeley, CA 94720-1382

Dear Raphael Breines:

I am writing because demolition of the Upper Hearst Parking Lot will significantly impact my daily commute. I use an "F" permit to park in that lot each day, and I walk to my office at Berkeley Law. Because I live north of campus in Kensington, parking in this lot allows me to avoid the traffic congestion on Piedmont Avenue. As a single working parent, every minute counts for being able to drop off my children at school and get home in time to prepare dinner. Demolition of the Upper Hearst Parking Lot will have a significant detrimental impact on my ability to balance my work and family responsibilities.

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101.1

I hope that there will be new F permit spaces added on the northeast side of campus to compensate for those that will be lost when the Upper Hearst Parking Lot is demolished.

Sincerely,  
Emily Bruce

--

**Emily Bruce, J.D.** (she/her/hers)  
Assistant Director of Student Services - Equity and Inclusion  
University of California, Berkeley  
School of Law  
280 Simon Hall  
Berkeley, CA 94720-7200  
(510) 664-4973  
[Make an appointment](#)



Letter IND 102

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst development project

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**Hawley Holmes** <hsh1016@comcast.net>

Thu, Apr 4, 2019 at 11:17 AM

To: planning@berkeley.edu

Hello planners.....my grandmother had a saying "double ugly". This building is double ugly! It is oversized and dwarfs the surrounding structure-including the lovely Goldman School Bldg. It literally sits on top of the street with no room for landscaping-not even a street tree to hide the bldg. At least use the scaled down version please!.....I have been a North Berkeley resident for 26 years and watched the slow over step of the University into our neighborhood. This is massive.....Hawley Holmes , [1721 Spruce Street,94709](#)

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This email has been checked for viruses by Avast antivirus software.

<https://www.avast.com/antivirus>



Letter IND 103

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Development

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**Kathaweaver** <kathaweaver@yahoo.com>

Thu, Apr 4, 2019 at 2:22 PM

To: planning@berkeley.edu

Raphael Brienés, Senior Planner

Dear Raphael Brienés,

As a member of the Hearst neighborhood, I am very familiar with this corner and would like you to know that I think the Project would be best served by rethinking the oversized proportions visible in the artist rendering. I understand the desire to fit even to stuff as much as possible into a limited space but this as architecture is just not good enough for a world class university, my alma mater.... which needs to set an example for how to use space in a humanistic way along the lines of Christopher Alexander's vision. Under the pressures of need I know this is not a moment for purism, and that compromise must be made with an ideal. I'm sorry to say that the present design strikes me as a misstep, something to put forward and then go on to something better that has the look of rightness and belonging, a building complex meant not just to satisfy an immediate need but a structure that will provide a degree of aesthetic satisfaction to be appreciated by many future generations. I hope you agree that the present design is not appealing and can be very much improved.

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103.1

With best wishes,  
Kathleen Weaver



*Richard J. Jackson, MD, MPH, FAAP, Hon AIA, Hon FASLA  
2617 Le Conte Avenue Berkeley, CA 94709*

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April 4, 2019

John Arvin, Associate Vice Chancellor Capital Strategies, UCB  
Kyle Gibson, Communications Director, Capital Strategies, UCB

Dear Mr. Arvin and Mr. Gibson:

As residents of the northside community, my wife and I appreciated the opportunity to attend and offer comments at the public hearing in March on the proposed enlargement of the Goldman School of Public Policy, changes to the parking structure, and the addition of new public spaces and housing at the corner of Hearst and La Loma Avenues. The following is a brief summary of my comments at the meeting.

First, I commend UC Berkeley for being a major contributor and anchor to the community of Berkeley and to the people of California. My wife and I, one of our children, and many members of our extended families are Cal alumni and are proud of our association. Joan and I are lifetime members of Cal Alumni. I also believe that the mission of the Goldman School of Public Policy is among the most important in the University.

At the same time as neighbors who live on Le Conte Avenue within 100 yards of the proposed structure, we ask that the University address the following concerns about the design, size, and neighborhood impacts of the Goldman project:

- **The architectural drawings of the proposed structure provoke deep concerns for me, my wife, and our neighbors.** UC Berkeley has a proud history that deserves the creation of structures that are consonant in size and style with the beauty and history of the northside community with appropriate setback from the street. The design and scale of the proposed project are out of character with the Arts and Crafts architectural style of homes and public buildings in the North Berkeley community, including the beauty of existing Goldman buildings. With Berkeley's envied history of fine architects including John Galen Howard, Bernard Maybeck, and Julia Morgan, it is mystifying that the University would propose to construct such an expansive eyesore in a prominent and historical location across from Founders Rock.
- **A second major concern is a further increase in the vehicle traffic associated with the proposed project.** We are concerned that the environmental impact report is silent on the impact on neighborhood streets. The reality is that the University and the City of Berkeley have not effectively managed traffic flow in the northside area. The recent Hearst Avenue redesign is an example of that, where both the City and the University failed to consider impacts on adjacent streets and failed to listen to neighborhood concerns. The Hearst redesign has effectively turned narrow neighborhood streets like Le Conte Avenue into high volume arterials. It is extremely important to us and to our neighbors that the project not add vehicle traffic to neighborhood

IND 104.1

IND 104.2

streets and that exits from the proposed parking structure only permit vehicles to turn onto southbound La Loma Avenue and westbound Hearst Avenue. We ask that the University work with the City to remedy the high volume of that traffic that floods Le Conte.



- **The scarcity of parking was raised as an issue at the public meeting, however, I strongly assert, as a physician and public health leader, that the University should be working to decrease driving and increase public transportation.** This is especially germane as the University is pursuing aggressive sustainability strategies and efforts. Saturating the area with additional parking, as was suggested by one speaker at the meeting, is not the answer. We do not need more parking in upper Berkeley—this will make traffic far worse -- rather what is needed is better public transit. To that end, I urge that the Bear Transit shuttles run more frequently. The current 30 minutes between Bear shuttle buses is far too long and the service is too infrequent. For a person carrying heavy books and other materials, waiting up to 30 minutes for a bus is a profound disincentive to use public transit. One solution would be to negotiate with the Lawrence Berkeley Lab to allow members of the university community to take the LBL buses, which is currently not permitted. I understand there are political and administrative obstacles in working with the US Department of Energy, yet since UCB allows LBL employees to use its buses, there should be good neighbor reciprocity. Both Bear Transit and LBL buses travel along Hearst Avenue and coordinating usage would reduce overall traffic flow while increasing bus access.

IND 104.3

- **On the subject of housing,** I fully understand the pressures the University is confronting as it works to provide adequate class space, office space, and housing for students and faculty. Over the last 15 years of my career, I have focused on built environment and health, including housing and its impacts on health. It is well established that housing that is occupied by year-round residents supports the economic, social, and cultural vitality of a community much better than part-time residents, and I would support housing in the Goldman project for faculty and their families. The availability of excellent Bear Transit along with ride share options would be an asset to them and ease the traffic burden on the community.

IND 104.4

Thank you for your hard work and attention to these matters.

Respectfully,

A handwritten signature in black ink that reads "Richard J. Jackson MD MPH".

Richard J Jackson MD MPH

[DickJackson@ucla.edu](mailto:DickJackson@ucla.edu) Professor emeritus UCLA Fielding School of Public Health; Former Director, CDC National Center for Environmental Health; Former Director, California Department of Public Health; Elected honorary member, American Institute of Architects; Honorary Fellow, American Society of Landscape Architects; Elected member, United States National Academy of Medicine.

Cc:

Chancellor Carol Christ, UCB

Director Vini Bhargava, UCB Physical and Environmental Planning

Todd T. Henry, UCB Senior Planner

Ruben Lizardo, UCB Director Govt and Community Relations

Seamus Wilmot, UCB Director of Parking and Transportation

Dean Henry E Brady, Goldman School of Public Policy, UCB

Steven Finacom, City of Berkeley Landmarks Preservation Commission

Councilmember Susan Wengraf, City of Berkeley, District 6

City Engineer Hamid Mostowfi, City of Berkeley

Transportation Manager, Farid Javandel, City of Berkeley

Joan M Guilford MPH JoanGuilford@gmail.com



Letter IND 105

Planning Departmental &lt;planning@berkeley.edu&gt;

## Upper Hearst Garage demolition

**Kat Sutton** <kathleensutton@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Fri, Apr 5, 2019 at 12:47 PM

To whom it may concern,

I am writing to express my concerns regarding the demolition of the Upper Hearst Parking Garage at UC Berkeley this Fall.

As a UC Berkeley staff member, I pay \$109 per month for a F permit, which equates to paying \$1,308 per year just to park where I work. Even with these high rates, the staff is not guaranteed parking. I work in Stanley Hall, so the Upper Hearst Garage is the closest lot to park in. That garage fills up before 9am most days (F spots), so my only other options are the Lower Hearst Garage or the Foothills Lot, which is quite steep to access. While I can make the hike up there, how will this impact the disabled or those who cannot make the steep hike?

Every year, UC Berkeley increases our parking rates while simultaneously decreasing our parking options. Most recently the Upper Hearst garage re-allocated the parking spots on the top floor, giving the vast majority of spots to C permit holders, despite those spots never filling up during the day (F spots are always full). The University Hall parking spaces by the Bank of America lot were also eliminated. These are only 2 parking lots/garages that have impacted me, but there are other parking areas that have been impacted as well.

As a staff member, I feel as though UC Berkeley does not value me. While student housing may be a crisis, so is employee parking. Was there any type of input or discussion with the employees who work around this garage to see how we feel about this demolition? Or did UC Berkeley just decide to do this without realizing the impact of their decision? To demolish yet another parking garage that is providing parking to almost 400 employees, when parking is so limited as it is, is a huge slap in the face to everyone who works at UC Berkeley. I am not the only staff member who feels like we are at the bottom of the UC totem pole, behind both faculty and students, and decisions like this reinforce that notion.

I would like to know what UC Berkeley is planning to do to offset this demolition. I am betting that our parking rates will increase again this year, but I think they should be reduced due to this demolition. I live over an hour away and do not have the option to take public transportation, nor should I have to. What is going to happen when I arrive to work and cannot find parking? I refuse to double park my car or pay for street parking. Is UC Berkeley going to allow more telecommuting days for staff? Will they reduce our outrageous parking rates? Or will they build another parking garage within the same vicinity? Something must be done to alleviate this poor decision.

I ask that UC Berkeley please re-consider the decision to demolish the Upper Hearst Parking Garage as it will have a huge impact for the people who work in the Upper Hearst area.

Thanks,  
Kat

--  
Kat Sutton  
Research Administrator  
University of California, Berkeley  
206 Stanley Hall  
(510) 664-4922

IND  
105.1



Letter IND 106

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Demolition of Upper Hearst Parking Structure

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**Renee Frappier** <reneef@berkeley.edu>

Fri, Apr 5, 2019 at 1:40 PM

Reply-To: reneef@berkeley.edu

To: planning@berkeley.edu

Dear Raphael Breines,

I am a long-time campus employee and currently work in Stanley Hall (closest Faculty/Staff, F Permit, parking is the Upper Hearst Lot). I was very upset and concerned to learn of the upcoming destruction of yet another campus parking structure, this one being the one I use daily. Spending over \$100 a month out of my paycheck, if I'm not to the lot before 9am, I often cannot find a space already, and I can't imagine what it will be like once this lot is demolished. Based on the numbers from the campus parking and transportation website, there are over 300 parking spots in this lot, including the stack parking, and there are no other lots in this area that are either not already full by 9am, or they are less accessible (Foothill Lot does not have good walking access back down the hill, especially in the fall/winter months).

Are there plans to have replacement spaces in place by the time this lot is demolished? If not, what is the campus plan to accommodate all of the cars that currently park in that lot (the F permit spaces are always full)? If no additional parking is planned to replace this lot, is there a plan for additional telecommuting options or other resources to assist those affected by this situation?

I hope to hear that there has already been some planning around the impact this will have, along with some solutions.

Thank you for your time and I hope to receive some helpful information well in advance of this change.

Sincerely,  
Renee

**Renee Frappier**

Pre-Award Research Administrator  
University of California, Berkeley  
Berkeley Regional Services  
206 Stanley Hall  
Berkeley, CA 94720-3220  
510.643.6065  
[ReneeF@berkeley.edu](mailto:ReneeF@berkeley.edu)

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106.1



Letter IND 107

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Development

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**Tamara Gurin** <t\_gurin@yahoo.com>  
To: "planning@berkeley.edu" <planning@berkeley.edu>  
Cc: "htdenero@gmail.com" <htdenero@gmail.com>

Fri, Apr 5, 2019 at 8:19 AM

Dear Mr. Breines,

I am a local resident and I live 2.5 blocks away from the proposed project site. While I fully support the idea of building more housing and academic facilities on campus, I believe that the needs of local residents should be considered as well. After all, many of us work on campus or affiliated with UC Berkeley in various ways.

This building is going to significantly change the character of the neighborhood. Unlike many other buildings that were built recently - Jacobs Hall is a good example - it looks dominating, massive and incompatible.

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107.1

I voice my support for the Reduced Scale Alternative proposal which will be more in line with the architectural style of the historical neighborhood of Berkeley Hills.

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107.2

There is one more part of the proposal that I find extremely burdensome to the neighbors of UC Berkeley. Parking in the streets adjacent to the campus has become much more difficult in those 10 years that I have been living in Berkeley. We have elderly residents who rely on cars as the only mean of transportation to most of Berkeley Hills, while and not all the residential buildings have off the street parking available. We have equally elderly visitors who have to search for parking 4-5 blocks away from our location because so many visitors to UC Berkeley take our street parking spots that are close to campus. Demolition of the large parking space in proximity to Greek Theater and the stadium will make our weekends and days of the Cal events even noisier, congested and stressful. I do not see any alternative parking options proposed with this development.

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Sincerely,

Tamara Gurin  
[2634 Virginia Street](#)  
[Berkeley](#)



Letter IND 108

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Hillary Hansen** <hansen.hillary@yahoo.com>  
To: planning@berkeley.edu  
Cc: "htdenero@gmail.com" <htdenero@gmail.com>

Sat, Apr 6, 2019 at 12:26 PM

Hillary Hansen  
2711 Virginia Street  
Berkeley, CA 94709

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California Berkeley  
300 A&E Building  
Berkeley, CA 94720-1382

Dear Raphael Breines,

I live very near to the proposed Upper Hearst Development Project, about 3 blocks away. As a long time resident of this neighborhood I am writing to ask that you select the Reduced Scale Alternative and NOT The Proposed Project for the Upper Hearst Development Project.

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While I understand that UC Berkeley is a growing, thriving campus that will continue to need student and faculty housing, the large version this project will overwhelm our neighborhood. The smaller scale version is more in keeping with the size and scale of the other buildings around here.

The buildings around the northeast side of campus also make a lot of noise at night. My house, constructed of materials from early 1900s, faces right onto these buildings, which can put out a lot of sound from equipment inside and on their roofs. On two occasions I have had to call your office to complain about buildings that got loud all of a sudden and needed maintenance. Your response was terrific and really helped, but it's undeniable that these tall campus buildings put out a lot of sound, even when they are running great. I am very concerned about what noise will be created by the taller version of your proposed building. I hope you can support a smaller version better in keeping with our very dense, hilly neighborhood where many people face right onto the new site and live in old buildings without much insulation.

IND  
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Thank you,  
Hillary Hansen



Letter IND 109

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Lauren Dundes** <ldundes@mcdaniel.edu>

Sat, Apr 6, 2019 at 4:44 PM

To: "planning@berkeley.edu" &lt;planning@berkeley.edu&gt;

To Whom It May Concern:

I am writing to let you know that while I understand the need for more academic and housing facilities, the current plans are out of proportion to the neighborhood. Please consider reducing the scale, as it would be more consistent with the feel of the neighborhood where my family moved in 1970.

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I hope that you will take into account the wishes of individuals living nearby, especially those of us for whom Cal is near and dear to our hearts.

Thank you for your time.

Lauren Dundes

1590 La Vereda

Berkeley, CA. 94708





Letter IND 110

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Lisa Lum** <lisaannlum@mac.com>

Sun, Apr 7, 2019 at 3:01 PM

To: planning@berkeley.edu

Cc: Lisa Lum &lt;lisaannlum@mac.com&gt;, Michael Hohmeyer &lt;hohmeyer@mac.com&gt;

**TO:**

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California Berkeley  
300 A&E Building  
Berkeley, CA 94720-1382  
[planning@berkeley.edu](mailto:planning@berkeley.edu)

**FROM:**

Lisa Lum & Michael Hohmeyer  
1630 Arch St.  
Berkeley, CA 94709  
[lisaannlum@mac.com](mailto:lisaannlum@mac.com), [hohmeyer@mac.com](mailto:hohmeyer@mac.com)

April 7, 2019

Dear Mr. Breines:

My husband, Michael Hohmeyer, and I, Lisa Lum, of 1630 Arch St. are not opposed to the University building additional housing and facilities, but are very opposed to the Upper Hearst Development as the plan now stands. We feel that it is too much bigger, taller & massive than the rest of the buildings in this historic neighborhood and will dwarf the existing structures around it. Without any setback, the project comes clear out to the sidewalk, essentially creating a 6-story "wall" along the entire block. It is also aesthetically jarring in how stylistically different it is from the surrounding structures. We ask that the University strongly consider the "Reduced Scale Alternative" instead.

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For those of us who live on the Northside, we desperately want to keep the qualities which make Berkeley beautiful and unique. This includes preserving the aesthetic integrity of our historic neighborhood which was founded on the principle of integrating nature and architecture. We ask that the University work with us to preserve this by making the proposed development more integrated in style and proportion.

Regards,

Lisa Lum & Michael Hohmeyer  
1630 Arch St.  
Berkeley, CA 94709





Academic Building



Source: Solomon Cordwell Buenz, May 2018



Residential Building

<https://capitalstrategies.berkeley.edu/sites/default/files/draft-supplemental-eir-2020lrp.pdf>



Letter IND 111

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Monique Webster** <moniquemwebster@gmail.com>  
To: planning@berkeley.edu

Sun, Apr 7, 2019 at 3:35 PM

We support the REDUCED SCALE ALTERNATIVE but we oppose the Proposed Upper Hearst Development Project.

We support additional academic and housing facilities if they are well designed and do not overwhelm our historic neighborhood. The proposed project is simply too massive, too tall, and unattractive. The Reduced Scale Alternative is more in keeping with the size and height of other structures in the neighborhood.

Therefore, we ask that you select the Reduced Scale Alternative and NOT The Proposed Project. We ask that you improve the design of the building to make it less massive in appearance and more in keeping with the neighborhood.

Thank you,

Monique Webster and Jonathan Kerry-Tyerman

[2370 Hilgard Ave, Berkeley](#)

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Letter IND 112

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Bettina** <bslewis18@gmail.com>

Mon, Apr 8, 2019 at 7:59 AM

To: Michael Hohmeyer &lt;hohmeyer@mac.com&gt;, planning@berkeley.edu

Cc: Lisa Lum &lt;lisaannlum@mac.com&gt;

**TO:**

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California Berkeley  
300 A&E Building  
Berkeley, CA 94720-1382  
[planning@berkeley.edu](mailto:planning@berkeley.edu)

**FROM:**

Bettina Lewis  
2271 Virginia St.  
Berkeley, CA 94709  
[bslewis18@gmail.com](mailto:bslewis18@gmail.com)

April 8, 2019

Dear Mr. Breines:

The Upper Hearst Development should use the Reduced Scale Alternative.

We live at 2271 Virginia Street and encourage the University building additional housing and facilities, but we are very opposed to the Upper Hearst Development as the plan now stands. It is out of proportion to the incredibly unique quality of the neighborhood and city, qualities that will be forever gone as a consequence of decisions we make now. Visitors and renters are charmed by the special character of this neighborhood, an oasis of peace in the city.

It is much bigger, taller & massive than the rest of the buildings in this historic neighborhood and will dwarf the existing structures around it. Without any setback, the project comes clear out to the sidewalk, essentially creating a 6-story "wall" along the entire block. It is also aesthetically jarring in how stylistically different it is from the surrounding structures. We ask that the University strongly consider the "Reduced Scale Alternative" instead.

Like all Northside and visitors/relatives/tourists/historians, we have an obligation to keep what makes Berkeley beautiful and unique. This includes preserving the aesthetic integrity of our historic neighborhood which was founded on the principle of integrating nature and architecture. We ask that the University work with us to preserve this by making the proposed development more integrated in style and proportion.

Sincerely,

Bettina Lewis  
2271 Virginia St.  
Berkeley, CA 94709

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112.1

April 8, 2019

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California, Berkeley  
300 A&E Building, Berkeley CA, 94720-1382

**Re: Draft Supplemental Environmental Impact Report  
Upper Hearst Development for the Goldman School of Public Policy**

Dear Mr. Breines:

As a member of the City of Berkeley Landmarks Preservation Commission I voted to submit a letter regarding the Upper Hearst Development, and I am a signatory to the neighborhood letter circulated to neighbors by Henry DeNero and Daniella Thompson. I agree with the sentiments expressed in both those communications in support of additional University academic space and additional housing. However, after more careful reading of the SEIR I have serious reservations about its adequacy, especially if it is intended to justify the full build-out of the proposed project. Therefore, I am submitting the attached comments as an individual citizen.

IND 113.1

Although the SEIR project description is inadequate, I realize that University planners continue to refine and improve project designs while preparation of an EIR is underway. But the confusion created by the SEIR project description goes well beyond details. It has made explaining the project to neighbors or defending possible alternatives extremely difficult. This confusion in the SEIR and the seemingly willful downplay of some serious impacts of the project make it an insufficient document.

IND 113.2

I would like to add two personal notes: First, I very much appreciate the time given by Vini Bhargava and Ruben Lizardo to meet with Henry DeNero and me to discuss the project. Second, counting my grad school days, my wife and I have lived within three blocks of the project site for over 48 years. We knew the grandson of the builder of the Bentley House, a city landmark on Le Conte Avenue, and we knew the daughter of the builder of one of the Maybeck-designed homes on La Loma Avenue. Dorothea Lange once lived in a house above us on Virginia Street; her granddaughter now lives just below us. We have shared our neighborhood with University deans and distinguished scholars, and our family has been enriched by this proximity. We love our neighborhood and will do everything we can to keep it the special place it is.

Sincerely,

Christopher Adams  
2701 Virginia Street  
Berkeley, CA 94709

## **Comments on the Draft Supplemental Environmental Impact Report Upper Hearst Development for the Goldman School of Public Policy**

Christopher Adams  
2701 Virginia Street  
Berkeley, CA 94709

### **1. The University failed to effectively conduct public hearings for the SEIR:**

The University initially scheduled *one* hearing on the same night that the Berkeley City Council routinely meets and only added a hearing after complaints. The locations for both public hearings seem to have been selected purposely to inconvenience those most impacted by the project—Berkeley citizens living on the north side of the campus. Neither meeting was within reasonable nighttime walking distance of the Proposed Project or the neighborhood which it will impact. The Alumni House is on the extreme south side of the campus; University Hall is off campus to the west. An online review of suitable University-owned venues on the north and northeast side of the campus and near or adjacent to the project site shows availability of at least the following:

Bechtel Engineering Center: 250 seats  
Goldman School of Public Policy: 250 seats  
Hearst Mining Building: 120 seats  
Jacobs Institute: 130 seats  
Sutardja Dai Hall: 149 seats  
Soda Hall: 100 seats  
Stanley Hall: 300 seats

([https://history.berkeley.edu/sites/default/files/event\\_venues.pdf](https://history.berkeley.edu/sites/default/files/event_venues.pdf))

This list omits another nearby University-owned venue: Northgate Hall: 150 seats (estimate)

IND 113.3

### **2. The University has made the SEIR into a post-hoc rationalization by presenting and advocating for the project at a meeting of The Regents on March 13, 2019, a meeting that was never noticed to interested community members.**

The Proposed Project was presented to the Finance and Capital Strategies Committee of The Regents at its meeting on March 13, 2019. At this meeting the physical parameters of the project were fully described in connection with an outline of its financing. Questions by Regents and responses by campus representatives overlapped and impinged on important issues discussed in the SEIR, such as project

IND 113.4



height and the amount of parking to be provided. At no time in this discussion were the environmental impacts of the project or the fact of the preparation of an SEIR mentioned. Even if technically not illegal, this discussion directly contravened the spirit and purpose of the California Environmental Quality Act, which is to guide decision makers, and it has created a sense of suspicion among neighbors and the community at large. This is aggravated by the fact that despite clear evidence of citizen concern about the impact of the project the Berkeley Campus made no effort to notify project neighbors, community members, or officials of the City of Berkeley that this meeting would take place.

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IND 113.4

**3. The University's descriptions of parking in the project are inconsistent, making it impossible to evaluate parking impacts, whether evening or daytime.**

On page 38 of the SEIR, it states that "it is assumed that the Upper Hearst Development would reduce the total number of parking spaces on-site from 407 to approximately 200...." However, UC Berkeley Vice Chancellor Rosemarie Rae stated at the meeting of the Finance and Capital Strategies Committee of The Regents on March 13, 2019 that parking "will consist of 170 spaces."  
(<https://regents.universityofcalifornia.edu/meetings/videos/mar2019/mar2019.html#fin>; the statement occurs at approximately 1:35.) A difference of 15% goes beyond a normal definition of "approximate." The reduced amount of off-street parking will further aggravate the parking impact of the project, as noted in the next two comments.

IND 113.5

**4. The SEIR fails to adequately evaluate evening parking impacts and cumulative parking impacts:**

The Proposed Project will contain an event space for up to 450 persons (SEIR page 19), making it the fifth largest assembly room on the campus and the only large room on the north side of the campus. The other large halls, Zellerbach Hall, Zellerbach Playhouse, Wheeler Auditorium, and Pauley Ballroom, are located on the south side and close to public parking maintained by the University. The nearest public parking to the Proposed Project is half a mile away (according Vice Chancellor Rae, as quoted above). This increase in parking need is not addressed in the SEIR. Further, the cumulative impact of this parking when events occur simultaneously at the Greek Theatre is not addressed in the SEIR. Because the city's preferential parking ordinance does not apply during night hours, evening events at the University already have a severe impact on the adjacent residential neighborhood. The SEIR does not evaluate the added impact of the Proposed Project or suggest any mitigating measures.

IND 113.6

**5. The SEIR fails to propose reasonable mitigation measures for the increased day-time parking from the residential component of the Proposed Project and**

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IND 113.7



**from the loss of staff parking because of the reduction of the number of existing parking spaces.**

IND 113.7

In informal discussions with University officials, neighbors have been told that residents of the Proposed Project will not be eligible for City-issued Preferential Parking Permits; however, no mitigation measure in the SEIR states this. Because portions of the adjacent neighborhood were built before cars were in common use, many of the houses lack any off-street parking. The street parking that exists is needed by neighborhood residents, who must pay for a Preferential Parking Permit. Because of frequent scofflaws among University students and employees and the inability of the City to constantly monitor parking permits, it remains a severe problem, which will be further exacerbated by the Proposed Project without mitigation measures.

**6. The SEIR fails to justify why the academic portion of the Proposed Project is needed except in vague terms amounting to little more than wishful thinking.**

On page 18 of the SEIR it states:

IND 113.8

The new academic building would accommodate GSPP operations that currently take place in the existing GSPP buildings and other rented space on campus, while expanding the program's overall capacity to serve an additional five staff members and 30 students on average by the end of the 2023 school year.

No basis for the need for five new staff members is given or why 30 additional students are expected. As The Regents Finance and Capital Strategies Committee was informed in Item F7 of the agenda packet for March 13, 2019, the GSPP is already "ranked the number one policy analysis graduate program in the nation..." But even if one accepts that the increases are justified, there is absolutely no explanation why a building of 40,000\* square feet is necessary to achieve this goal. Five faculty offices built to State-accepted standards would be about 600 assignable square feet (asf). Study desk space for 30 students would equal, at a guess, 2,400 asf. Converting both figures to gross square feet (gsf) would bring the total to perhaps 7,500 gsf or approximately 20% of the size proposed. In addition to asking why such a large building is necessary, as a California taxpayer, the author of these comments would ask how the maintenance and utility costs for all this additional space can justifiably be charged to the University's State-supported operating budget.

\*The SEIR states 37,000 gross square feet on page 2; however, Vice Chancellor Rae, in the video cited above, stated 40,000 square feet, a further example of confusion in project description.

**7. The SEIR fails to justify the size of the housing portion of the Proposed Project.**

At a scoping meeting held at the GSPP on March 20, 2018 Dean Brady spoke to community members, explaining that the intent of the project was to lease the land to a private developer who would build both the academic building and the housing and would then manage and lease the housing for an extended lease (99 years, if memory serves) and give the academic building to the University as an upfront payment. In other words, the University is linking the size of the academic building to the maximum profit that a developer receives from renting apartments. The SEIR provides no other reason for the size of the residential portion of the project. Yet the project is being presented to the public and to The Regents at its enormous size, despite its impacts on its neighbors and the City of Berkeley, as enumerated in the SEIR and as amplified by these comments and other comments that may be submitted.

IND 113.9

**8. The SEIR incorrectly states that the Proposed Project would not create a source of substantial light and glare that would adversely affect day- or night-time views in the area.**

On pages 55 and 56 it states:

New exterior light fixtures and illumination through windows from interior lighting would result in an increase in nighttime ambient light levels near the Project site. Exterior lighting also would occasionally be used on the rooftop terrace of the new academic building, during evening events. However, exterior light fixtures would be designed to direct light downward, which would minimize offsite spillover of light...New street trees along the Project site boundary also would partially screen new lighting from the view of adjacent residences. In addition, Mitigation Measures AES- 3-a and AES-3-b in the 2020 LRDP EIR require the use of shields and cut-offs in lighting and the minimal use of reflective exterior surfaces. Implementing these measures would minimize light and glare from the proposed Upper Hearst Development. Therefore the development would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. This impact would be less than significant.

IND 113.10

This evaluation completely ignores that the Proposed Project will be 72 feet high, adjacent to a residential neighborhood where zoning restricts height to 35 feet and where most existing buildings are far below that limit. No street trees will grow to 72 feet, and no "shields" can control light from a fixture 70 feet above the ground. The promise of "minimal use of reflective exterior surfaces" is completely contradicted by the use of "cement plaster, fiber cement panels, painted aluminum, and...aluminum accent panels" (SEIR, page 38) all of which would appear to be painted white or silver (SEIR, Figure 18).

Further, the SEIR (page 38) states that “All roofing materials would have a high solar reflective [sic] index....” According to the US Green Building Council (<https://www.usgbc.org/glossary/term/5590>), the higher the solar reflectance index, the closer to white the material will be. Because the Proposed Project is below many neighboring houses, the site is visible to homes above. There is no evaluation in the SEIR of what the glare of roofing materials with a “high solar reflective [sic] index” will be, and there are no mitigation measures to ameliorate such impact.

IND 113.10

#### **9. The SEIR fails to consider the impact of shading the solar panels on an adjacent University building.**

The SEIR fails to evaluate the irreversible impact of the project on the array of photovoltaic panels on the roof of an adjacent building to the project, Cloyne Court. These panels are obscured by lettering in the aerial photo of the project site (Figure 2, page 14) but are clearly visible in the photograph shown to the Finance and Capital Strategies Committee of The Regents at their meeting of March 13, 2019 (<https://regents.universityofcalifornia.edu/meetings/videos/mar2019/mar2019.html#fin>; the photo is at approximately 1:31). Given the proposed height of both the academic and housing portions of the project, it is likely that these panels will be shaded much of the time all year, and most of the time in winter. In Table 9 on page 137 under “Reduce Energy Demand,” nothing is noted about the project’s adverse impacts on on-site photovoltaic generation of electricity, nor are there proposed mitigation measures. It is recognized that the University has its own CEQA Guidelines; however, at the time of writing this comment an online search made it appear that they are no longer available to the public. In any case the University’s guidelines should mirror the State CEQA Guidelines ([http://resources.ca.gov/ceqa/docs/2018\\_CEQA\\_FINAL\\_TEXT\\_122818.pdf](http://resources.ca.gov/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf)), which include this regarding Energy:

IND 113.11

#### **VI. ENERGY. Would the project:**

- a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation?
- b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? (Guidelines, page 58)

Because the shading by the tall new buildings of the Project will obstruct a source of renewable energy, the impact will be significant and must be evaluated.

**10. The SEIR relies on misleading and incomplete visual material to inform both community members and decision makers of the significant and unmitigated visual impact of the Proposed Project.**

**Drawings are misleading because:**

- The floor plans, sections, and renderings of the housing portion of the Proposed Project included in the SEIR are internally inconsistent. The Proposed Site Plan (Figure 4) appears to be consistent with the Renderings (Figure 18), but neither Figure 4 nor Figure 18 is consistent with Garage Level 1, 2, 3 Plans (Figures 5, 6, and 7), Residential Building Level Floor Plan 1 and 2-5 (Figures 8 and 9), and Residential Building Section (Figure 16).
- The written description on page 37 adds further confusion as it states: “One driveway from Hearst Avenue would provide vehicular access to the parking garage,” while Figure 4 shows the parking entrance from La Loma Avenue.

IND 113.12

**11. Drawings are incomplete because they fail to comply with the UC CEQA Handbook, Section 3.3.4 (<https://www.ucop.edu/ceqa-handbook/>) which states in part:**

The project description should also describe project design and siting *in relation to its environmental context*. [Italics added.]

“Description of project design, scale, and site. Include a site plan, sections [plural], *elevations* and a photograph of the project model, or computer simulation if available. [Italics added.]

(It should be noted that the UC CEQA Handbook, which was available online when these comments were initiated, is no longer available, at least to members of the public.)

IND 113.13

As noted above, the required site plan is inconsistent with all other drawings except Figure 4. There are no elevations, as mandated, and the computer simulation (Figure 18) is inconsistent with most of the other drawings. There is no indication on any plans of where the section (Figure 16) was taken. If taken at the midpoint of the building, the section is deceptive in its indication of building height at sidewalk level because of the extreme slope of the site perpendicular to the section line.

IND 113.14

Because of the lack of any elevation drawings, it is impossible for a reader of the SEIR to know what the height of the residential building actually is. On page 8 of the SEIR, it is stated that “the residential roofline would be up to approximately 72 feet tall on the Ridge Road (north) side, up to 69 feet on the La Loma Avenue (east) side...” Because of the steep slope of Ridge Road downward from the corner of La Loma, a difference of only 3 feet between these two points defies credibility.

IND 113.15

Most critically, there are no drawings of any sort that show the project design and siting *in relation to its environmental context*. The renderings of the project (Figure 18) show only the academic portion as it relates to the existing historic Beta Theta Pi building occupied by GSPP. There are no drawings or sections of the housing portion which indicate the project's relation to neighboring buildings, such as Foothill Housing, Cloyne Court, or other historic buildings on Ridge Road. The author of these comments estimates that at the corner of La Loma and Ridge the residential building would be twice the height of the closest wing of Foothill Housing across La Loma Avenue and three times the height of the historic houses across Ridge Road. There is nothing in the SEIR to show this.

IND 113.16

## **12. The residential portion of the project fails completely to meet the Project Objectives stated in the SEIR.**

The Project Objectives, (SEIR, page 19) include the following:

- Design and build facilities that aesthetically enhance the City and the campus vicinity over existing conditions and that are *compatible with the surrounding neighborhood* [Italics added.]

IND 113.17

On page 38 of the SEIR under BUILDING DESIGN is the following:

"The proposed buildings would have a contemporary design, with concrete, glass, and metal as the predominant exterior materials. At the residential building, exterior materials would include cement plaster, fiber cement panels, painted aluminum, and windows framed by aluminum accent panels."

How does this project description meet the stated project objectives? Most of the neighboring buildings, including the designated historic landmarks and the University's Foothill Housing, are clad in wood siding or brown shingles. The residential portion of the proposed project (Figure 18) shows white plaster or concrete panels and steel-gray metal trim. None of this is "compatible" with the surroundings or even necessarily "contemporary." There is nothing among the other Project Objectives that indicates why an enormous curved white and gray monolithic structure is necessary or appropriate for the Goldman School or the University.

Other University projects have utilized materials that would significantly mitigate the impact of the large residential building and yet be "contemporary." The closest and best example is Sutardja Dai Hall, across the street from the GSPP buildings, which is clad in textured and tinted concrete and is immediately adjacent to the historic Naval Architecture Building and Northgate Hall, which are clad in wood shingles. Aluminum windows are widely available in anodized bronze aluminum, which is compatible with wood and wood cladding and is ubiquitous in the very "contemporary" buildings of The Sea Ranch on the north coast of California.

IND 113.18

**13. The SEIR fails to consider the actual area available for development, which could mitigate some of the impacts of scale and size of the housing portion of the project.**

The reconstruction of the intersection of La Loma and Hearst eliminated the southbound right-turning lane from La Loma to Hearst. The landscape where the turning lane used to be is now maintained by the University, which suggests ownership reverted to the University after the street change. If not, it would seem that a simple quitclaim from the City to the University would be possible. The land area, of approximately 1,250 square feet, could be added to the footprint of the housing floors and permit the addition of two units per floor, adding 10 units to the build-out project or 8 units to the Reduced Scale Alternative.

IND 113.19

Squaring off the corner would also permit a design gently echoing Newman Hall, which once stood there (see Figure 2 in the response to the SEIR submitted by Berkeley Architectural Heritage Association). The rectilinear but articulated walls of Newman Hall and the Phi Kappa Psi fraternity house north of it are already suggested by the articulated east wall of the housing floors shown in Figures 8 and 9 of the SEIR.

**14. The SEIR analysis of recreational facilities fails to acknowledge that the University has willfully allowed existing facilities to deteriorate.**

The SEIR states on page 160:

Demolition of the Upper Hearst parking structure would result in the loss of the La Loma athletic field on its rooftop. Currently, several tenants use this space on an infrequent basis under memoranda of understanding with UC Berkeley Recreational Sports including uses such as unmanned aerial vehicle development and rooftop gardening. After demolition of the field, UC Berkeley Recreational Sports would relocate existing recreational use to other campus facilities. Consistent with 2020 LRDP Mitigation Measure PUB-4.4, UC Berkeley has analyzed whether the loss of recreational use at La Loma field would result in increased use at other campus facilities to the extent it would result in the physical deterioration of those facilities. Because of the low level of existing recreational demand at La Loma field, UC Berkeley has determined that other facilities can accommodate this demand without causing overuse and physical deterioration of such facilities. New recreational space to compensate for the field's loss would not be needed.

IND 113.20

What the SEIR fails to disclose is that the "La Loma athletic field" consists, in fact, of several tennis courts, which UC Berkeley Recreational Sports has allowed to fall into complete disrepair by failing to replace nets or patch concrete surfaces. The court walls are now defaced with graffiti, and the entrance is chained and padlocked. To suggest that the resultant "low level of recreational demand" reduces this impact to

insignificant is at the very least disingenuous. There are hundreds of students in nearby student housing who are completely without convenient access to recreational facilities because of the failure of the campus Recreational Sports administration, funded entirely by student fees, to maintain these facilities. This is a classic example of “demolition by neglect,” usually practiced by the owners of historic properties they wish to demolish. The SEIR is incomplete and incorrect to facilitate this fiction.

IND 113.20



*Figure 1. Locked entrance to “La Loma athletic field”*



*Figure 2. “La Loma athletic field”*

**15. Omissions and errors in the project description suggest recirculating a corrected SEIR may be necessary.**

Given that the principal concern of neighboring residents and historic preservationists is the extreme height of the housing portion of the Project, correcting these omissions and inconsistencies goes well beyond a simple revision of the Final SEIR. Their lack has made it almost impossible for those most immediately impacted to understand the project or correctly comment on it. To comply with the University's own CEQA guidelines the campus administration should consider recirculating the SEIR with corrections, particularly if the campus intends to go forward with the initial Project Design rather than the Reduced Scale Alternative. As noted above, a committee of The Regents has already discussed the physical planning aspects of the project without the benefit of any environmental analysis. Now it appears that The Regents will be asked to approve the project based on review of an inadequate and inaccurate SEIR.

IND 113.21



*A Neighborhood North of Campus*

January, 2019

Chancellor Carol Tecla Christ  
Office of the Chancellor  
University of California, Berkeley  
200 California Hall, #1500  
Berkeley, CA 94720-1500

Dear Chancellor Christ:

We are residents of a residential area that is adjacent to the UC Berkeley campus. Its boundaries are Cedar Street on the north, Euclid Avenue on the west, and La Loma Avenue on the east. We wish to bring to your attention a proposed project, which we believe will create considerable damage to our neighborhood unless significant changes are made to the project's design. The proposed project is the Upper Hearst Development for the Goldman School of Public Policy. We strongly oppose the project in its current form. However, with reasonable and sensible changes, such as those proposed in this letter, we would support the project.

IND 114.1

First, we wish to bring to your attention the attached letter that was sent to your planning department by the Berkeley Landmarks Preservation Commission (attachment). This letter describes many of the historically significant structures in the immediate area of the proposed project, and states a number of "concerns" with the project in its current form. We agree with all of the concerns raised by the Landmarks Preservation Commission. In addition to the historic structures cited in the letter, we would like to add that on the next block to the north of the proposed project sit several other historic buildings. These include the Hatfield House, designed and built by Julia Morgan for UC Professor Rand Hatfield, and two homes designed and built by her mentor, Bernard Maybeck. There are others.

IND 114.2

Simply put, the proposed project is too massive, too tall, too close to the streets, and of an entirely inappropriate architectural style for the residential area it

IND 114.3

adjoins. It will dwarf all surrounding structures and create a massive eyesore for the community.

Furthermore, there has been no provision for parking for the some 115 proposed apartments, which are intended not for undergraduates, but for graduate students and junior faculty, a population that is very likely to need automobiles. The lack of additional parking spaces will be exacerbated by the demolition of part of the existing parking structure as part of the project. The lack of parking in a residential area that is already struggling with a significant parking problem would be irresponsible. Since the lot at the corner of La Loma and Ridge is already on a grade, it would be easy to excavate the upper corner of the lot to add one or two parking levels under the proposed residential apartment building on that corner. These could be accessed from the exiting parking structure on the adjacent corner of La Loma and Hearst. In addition to adding to the neighborhood's parking problem, lack of on-site parking would further exacerbate the traffic problem on La Loma and Le Conte, an issue that has been brought to your attention by Joan Guilford and her husband Dr. Richard Jackson, among others, and is now being discussed with The City of Berkeley.

IND 114.4

IND 114.5

With these concerns and objections in mind. We offer the following suggestions aimed at making the project an asset, rather than a liability, for the community.

IND 114.6

1. Lower the height of the apartment building on the corner of La Loma and Ridge. This is the highest elevation point on the site of the proposed project and closest to the residential area. Yet, the developer has inexplicably designed the building to have its highest elevation at this point. One could easily add height on the interior of the block (the southwest side of the building) where no one would see it. The design of the building should essentially be reversed, limiting its height at the La Loma and Ridge to, say, 3 stories, or 40 feet.

2. Set the building back far enough to plant full-sized trees between the sidewalk and the building. In addition, the existing mature trees between the street and the sidewalk on the La Loma side of the building should be preserved.

IND 114.6


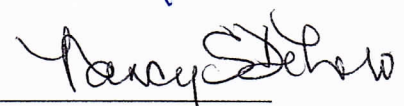
3. Excavate the corner of La Loma and Ridge sufficient to provide one to two parking levels that would be at or below grade at the corner. The objective should be to add at least one parking space for each apartment unit, plus an area for visitor parking. There simply is no parking on the street, without displacing existing residents.

4. Redesign the appearance of the building to be more in keeping with the residential character of its neighborhood.

As neighbors of The University, we want to support the further development of The Goldman School. We also support your efforts to provide more student and faculty housing close to Campus. We believe that with a little thought and planning, these goals can be accomplished without severely damaging one of Berkeley's most historic and beautiful neighborhoods.

We invite you to walk our neighborhood with us, and to see the proposed site as part of your deliberations. To do so, please contact Henry DeNero at [htdenero@gmail.com](mailto:htdenero@gmail.com) or (626) 253-2773.

Warmest regards,

| Name            | Address              | Signature                                                                             |
|-----------------|----------------------|---------------------------------------------------------------------------------------|
| Henry T. DeNero | 2695 Le Conte Avenue |  |
| Nancy S DeNero  | 2695 La Lente Ave    |  |



Signature Continued

Name

Address

Signature

Clifford Block

2634 Le Conte Ave, Berkeley

*Clifford Block*

Gladys Block

2634 Le Conte Ave, Berkeley

*Gladys Block*

Tom Ropelowski

1700 La Loma Ave. Berkeley CA 94709

Leslie Dixon

1700 La Loma Ave. Berkeley, CA 94709

CHRISTOPHER ADAMS

2701 VIRGINIA

*Chris Adams*

Janet H. Adams

2701 Virginia

*Janet Adams*

LISA TITUS

1705 LA LOMA AVE

*Lisa Titus*

Taly Rutenberg

1715 La Loma Ave

*Taly Rutenberg*

BARRY BRINKLEY

2613 LE CONTE AVE

*Barry Brinkley*

ROBERT KOLENKOW

1717 LA LOMA AVE

*Robert Kolos*

JOEL BEN LZZY

1715 LA LOMA AVE

*Joel Ben LZZY*

Jessica Wan

1709 La Loma Ave.

*Jessica Wan*

John DeNeo

1709 La Loma Ave.

*John DeNeo*

Signature Continued

Name

Address

Signature

Richard J Jackson

2617 Le Conte

[Signature]

Joan M. Guilford

2617 Le Conte

[Signature]

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Agreement Via Email (Email on File)

Barbara Borowiak, 1640 La Loma Avenue

Carole Petiet, 1683 La Loma Avenue

Catherine Breen, 2772 Hilgard Avenue

Jan Robitscher, 2634 Virginia Street

Julia Curtis, 1553 La Vereda Road

Jennifer Curtis, 2444 Virginia

Ruth Rosen, 1629 La Vereda Road

Sandra Schlesinger, 2619 Le Roy Avenue

Tamara Gurin, 2634 Virginia

Tom Trippe, 1551 La Vereda Road

Sue Londerville, 1546 La Loma Avenue



Letter IND 115

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Lower Hearst Development

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Jennifer Hamilton <jenniferhamilton@gmail.com>  
To: planning@berkeley.edu

Mon, Apr 8, 2019 at 12:16 PM

April 8, 2019

**TO:**

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California Berkeley  
300 A&E Building  
Berkeley, CA 94720-1382  
[planning@berkeley.edu](mailto:planning@berkeley.edu)

Dear Mr. Breines:

The Upper Hearst Development should use the Reduced Scale Alternative.

We live at 2271 Virginia Street and encourage the University building additional housing and facilities, but we are very opposed to the Upper Hearst Development as the plan now stands. It is out of proportion to the incredibly unique quality of the neighborhood and city, qualities that will be forever gone as a consequence of decisions we make now. Visitors and renters are charmed by the special character of this neighborhood, an oasis of peace in the city.

IND 115.1

It is much bigger, taller & massive than the rest of the buildings in this historic neighborhood and will dwarf the existing structures around it. Without any setback, the project comes clear out to the sidewalk, essentially creating a 6-story "wall" along the entire block. It is also aesthetically jarring in how stylistically different it is from the surrounding structures. We ask that the University strongly consider the "Reduced Scale Alternative" instead.

Like all Northside and visitors/relatives/tourists/historians, we have an obligation to keep what makes Berkeley beautiful and unique. This includes preserving the aesthetic integrity of our historic neighborhood which was founded on the principle of integrating nature and architecture. We ask that the University work with us to preserve this by making the proposed development more integrated in style and proportion.

Sincerely,  
Jennifer Hamilton  
[1611 Spruce St.](#)  
[Berkeley, CA](#)



Letter IND 116

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Comments Regarding Upper Hearst Development

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Joel ben Izzy <joel@storypage.com>  
To: planning@berkeley.edu

Mon, Apr 8, 2019 at 10:11 AM

Joel ben Izzy &amp; Taly Rutenberg

1715 La Loma Avenue,

Berkeley, CA 94709

510-883-0883

April 8, 2019

Raphael Brines, Senior Planner  
Physical & Environmental Planning  
University of California Berkeley  
300 A&E Building  
Berkeley, CA 94720-1382  
[planning@berkeley.edu](mailto:planning@berkeley.edu)

Dear Raphael Breines,

As close neighbors who will be greatly impacted by the proposed Upper Hearst Development project, we are writing this letter to express our opinion, hoping they will help lead to a reduced scale version of this project.

While we understand that need for additional housing for the UC Berkeley community, we have seen the drawings and read about the proposed building. The initial design is an absolutely massive, overwhelming affront to our neighborhood. It is way too big, with the higher part inexplicably built to extend the difference in the grade of the land. Built, as originally proposed, this will replace a large part of our view. It is not at all in keeping with our neighborhood and, while increasing population dramatically, it also cuts parking dramatically and thoughtlessly. The lack of setbacks intensifies all this.

Again, we realize the need for more housing. We see the draft supplemental environmental impact report suggests a reduced scale version of this building, with fewer stories to block our view, further setback, and less pressure on our already parking deprived neighborhood. We oppose the project as proposed, and strongly urge you to change plans for a reduced scale version.

IND  
116.1



4/8/2019

UC Berkeley Mail - Comments Regarding Upper Hearst Development

We look forward to seeing a reasonably sized building built on that corner. As your neighbors, we appreciate your attention to this matter.

Sincerely,

Joel ben Izzy & Taly Rutenberg





Letter IND 117

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Parking Comments

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**Karen Mendelow Nelson** <karenmn@berkeley.edu>

Mon, Apr 8, 2019 at 10:32 AM

To: planning@berkeley.edu

Hello Raphael Breines, Senior Planner,

Hello, It is really short sited to tear down the parking structure at Upper Hearst and eliminate so many parking spaces. Additionally to not put alternative parking plans into a new structure at that important corner of campus. Many staff and faculty work in this area of campus and park there regularly. As a person that lives quite far away, public transportation is not an option for me. As well, the campus gets money from Greek Theater concerts, graduations, move-in and outs etc, evening events, and us as staff permit holders. Everyday stacked parking is full.

The alternative parking on at foothill is way up the hill and lighting and paths to that lot are poor. As so many parking lots have gone away on campus, please include parking in the new structure.

Best,

Karen

--

Karen Mendelow Nelson  
Research Administrator/Grants Analyst

QB3  
BEST Region: Biology/Environmental Science/Technology  
University of CA Berkeley  
Stanley Hall 206  
Berkeley, CA 94720-3220  
510-666-3636  
[karenmn@berkeley.edu](mailto:karenmn@berkeley.edu)

IND  
117.1

## Public Comments: Upper Hearst Development project

**LOGAN BALDINI** <baldini@eecs.berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Mon, Apr 8, 2019 at 12:07 PM

Good day,

Please note this is my formal letter of opposition to the changes in the amount of parking spaces due to the construction project at the Upper Hearst Parking lot. There should be no negative change in the amount of spaces when construction is completed and there should be 90 more spaces to accommodate the new housing development.

Campus is constantly limiting the number of parking spaces for Staff/Faculty. Most staff commute farther than 20 miles and have limited access to public transportation or time wise it is not an option. The erosion of parking spots at Cal and specifically Upper Hearst puts more strain on staff and creates longer uncompensated transportation time and lowers morale.

The public transportation system in the bay area is poor and is not set up for long commutes. Current salary rates at Cal force staff to live far away limiting alternative transportation options. Removing all of these spots will cause an extra 15-45 min daily of transportation time to staff who already commute an about a hour each way. This will also increase the amount of staff using public street parking who move their cars every 2 hours. This creates a unneeded safety hazard and environment impact as people are constantly in the street and moving their cars around the block.

Lastly these all parking spots are reserved "rented" for game day BBQ tailgating and parking for people/alumni who donate to Cal. There will be a long term negative community and financial impact to the campus as I suspect these Alumni will pull their funding and will not attend games if they don't have anywhere to park.

IND  
118.1

Questions:

1. How does campus plan to mitigate for the loss of parking ?
2. Does campus have any plan / recourse for adding uncompensated time to staff who already commute long distances ?
3. Will campus compensate staff for this extra commuting burden?
4. What is the justification for removing parking spaces rather than adding them?
5. Why doesn't campus create a larger underground lot at Upper Hearst Development project?
6. Does campus study the impact of eliminating parking spots if so what are their findings?
7. Is campus going to fund alternative means of transportation for staff?
8. Is there a campus plan that focuses on creating easier access to campus?
9. why?
10. What is campus's long range plan for parking and access to campus for staff?
11. Will campus subsidize public transportation costs for staff since they are eliminating parking availability?
12. It costs 12.30 \$ a day, \$3,210 a year for me to take Bart from concord, Will campus increase my/our pay/subsidize this additional financial burden it is creating by elimination of the flexibility of being able to drive to work?
13. Has campus studied the long term financial and morale impact it has by taking away parking location for Alumni parking spots that are reserved "rented" for game day BBQ tailgating and parking for people/alumni who donate to Cal? There will be a long term negative community and financial impact to the campus as I suspect these Alumni will pull their funding and will not attend games if they don't have anywhere to park.

IND  
118.2

Respectively,

**Thanks !**

**Urgent Facilities issues please Call or TXT 510-384-8914**

**For all other items please fill out a [Facilities Ticket here](#)**

**Logan Baldini**

Building Manager - Cory Hall

Electrical Engineering and Computer Science

**University of California, Berkeley**

253 Cory Hall, MC 1770 | Berkeley CA 94720

**c. 510-384-8914** | t. 510-642-1468 | f. 510-643-7846

e. [baldini@berkeley.edu](mailto:baldini@berkeley.edu) | [www.eecs.berkeley.edu](http://www.eecs.berkeley.edu)

On Wed, Feb 27, 2019 at 1:53 PM LOGAN BALDINI <[baldini@eecs.berkeley.edu](mailto:baldini@eecs.berkeley.edu)> wrote:

Good day,

Please note this is my formal letter of opposition to the changes in the amount of parking spaces due to the construction project at the Upper Hearst Parking lot. There should be **no** negative change in the amount of spaces when construction is completed and there should be 90 more spaces to accommodate the new housing development.

Campus is constantly limiting the number of parking spaces for Staff/Faculty. Most staff commute farther than 20 miles and have limited access to public transportation or time wise it is not an option. The erosion of parking spots at Cal and specifically Upper Hearst puts more strain on staff and creates longer uncompensated transportation time and lowers morale.

The public transportation system in the bay area is poor and is not set up for long commutes. Current salary rates at Cal force staff to live far away limiting alternative transportation options. Removing all of these spots will cause an extra 15-45 min daily of transportation time to staff who already commute an about a hour each way. This will also increase the amount of staff using public street parking who move their cars every 2 hours. This creates an unneeded safety hazard and environment impact as people are constantly in the street and moving their cars around the block.

Lastly these all parking spots are reserved "rented" for game day BBQ tailgating and parking for people/alumni who donate to Cal. There will be a long term negative community and financial impact to the campus as I suspect these Alumni will pull their funding and will not attend games if they don't have anywhere to park.

For the record I rarely drive here but I can see how this will negatively impact EECS and other Cal campus community members.

Respectively,

**Thanks !**

**Urgent Facilities issues please Call or TXT 510-384-8914**

**For all other items please fill out a [Facilities Ticket here](#)**

**Logan Baldini**

Building Manager - Cory Hall  
Electrical Engineering and Computer Science

**University of California, Berkeley**

253 Cory Hall, MC 1770 | Berkeley CA 94720

**c. 510-384-8914** | t. 510-642-1468 | f. 510-643-7846

e. [baldini@berkeley.edu](mailto:baldini@berkeley.edu) | [www.eecs.berkeley.edu](http://www.eecs.berkeley.edu)



Letter IND 119

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Parking Garage Plan

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**Michelle Chang** <mcchang@berkeley.edu>  
To: planning@berkeley.edu

Mon, Apr 8, 2019 at 7:50 PM

Dear Mr. Breines,

I am a faculty member in the Chemistry department and park in the Upper Hearst Parking Garage. I wanted to first say that I think that it is a good idea to create more on-campus housing for grad students and junior faculty.

However, I also wanted to suggest that there should be a concerted effort to deal with the impact on commuting to campus. Clearly none of the new construction in the last few years replace the parking spots lost. My guess is that most of the planned parking spots in the new Upper Hearst plan will go either to residents or other special permit types.

One major problem is that there is really poor support for taking public transportation to campus. For example, I believe that the perimeter shuttle only runs every 30 min and the shuttle to Downtown Berkeley only runs every 20 min and at limited hours. Another solution may be creating satellite parking for those who have long commutes and really do need to drive.

Best wishes,  
Michelle Chang

IND  
119.1



Letter IND 120

Planning Departmental &lt;planning@berkeley.edu&gt;

## Upper Hearst Project

**Sanjay Govindjee** <s\_g@berkeley.edu>  
To: planning@berkeley.edu

Mon, Apr 8, 2019 at 9:33 AM

I would like to voice my concern that the traffic study is inadequately performed and did not in anyway look at the impact upon the majority of the users of the the north-east quadrant of the campus. In particular there is no serious attempt to study the flow of workers and the how this will affect their ability to work.

IND 120.1

I am also concerned that the traffic study concerning the apartment residents is inadequate. If the the housing is to be market rate or nearly so and intended for faculty, then it should assume that faculty have partners that will have to commute to work. This will add to the traffic and parking burden. It should also be assumed that faculty own cars and will need parking.

IND 120.3

Overall, I am surprised by the campus leadership has being unwilling to admit that a mistake was not made by not talking to COE faculty earlier about this project. As decision makers they have only 3 choices at this moment: (1) Tell the college of engineering that they do not matter. (2) Reject the Goldman expansion project and tell Goldman that they do not matter. (3) Step up like leaders, admit they made a mistake, and work together with the college of engineering and the Goldman school to find a solution that works for all interested parties.

IND 120.3

-sg

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Sanjay Govindjee, PhD, PE  
Horace, Dorothy, and Katherine Johnson Professor in Engineering

779 Davis Hall  
University of California  
Berkeley, CA 94720-1710

Voice: +1 510 642 6060  
FAX: +1 510 643 5264  
[s\\_g@berkeley.edu](mailto:s_g@berkeley.edu)  
<http://faculty.ce.berkeley.edu/sanjay>

Books:

Engineering Mechanics of Deformable Solids  
<http://amzn.com/0199651647>

Engineering Mechanics 3 (Dynamics) 2nd Edition  
<http://amzn.com/3642537111>

Engineering Mechanics 3, Supplementary Problems: Dynamics  
<http://www.amzn.com/B00SOXN8JU>

NSF NHERI SimCenter  
<https://simcenter.designsafe-ci.org/>

## Re: [Save Holy Hill] Public Comments: Upper Hearst Development Project [2 Attachments]

Simone Cherian <cynone1770@sbcglobal.net>

Mon, Apr 8, 2019 at 7:50 AM

To: Lisa Lum <lisaannlum@mac.com>

Cc: planning@berkeley.edu, Michael Hohmeyer <hohmeyer@mac.com>

Dear Mr Breines,  
 My husband Sunny Cherian and I, Simone Cherian, live at 1770 Arch Street. We share the same sentiment as Michael Hohmeyer and Lisa Lum. We hope the University will do the right thing and not continue to make life difficult for its neighbors and use the reduce scale alternative.

IND 121.1

Thank you.  
 Sunny and Simone Cherian



On Apr 7, 2019, at 3:01 PM, Lisa Lum [lisaannlum@mac.com](mailto:lisaannlum@mac.com) [saveholychill] <[saveholychill-noreply@yahoogroups.com](mailto:saveholychill-noreply@yahoogroups.com)> wrote:

[Attachment(s) from Lisa Lum included below]

**TO:**

Raphael Breines, Senior Planner  
 Physical & Environmental Planning  
 University of California Berkeley  
 300 A&E Building  
 Berkeley, CA 94720-1382  
[planning@berkeley.edu](mailto:planning@berkeley.edu)

**FROM:**

Lisa Lum & Michael Hohmeyer  
 1630 Arch St.  
 Berkeley, CA 94709  
[lisaannlum@mac.com](mailto:lisaannlum@mac.com), [hohmeyer@mac.com](mailto:hohmeyer@mac.com)

April 7, 2019

Dear Mr. Breines:

My husband, Michael Hohmeyer, and I, Lisa Lum, of 1630 Arch St. are not opposed to the University building additional housing and facilities, but are very opposed to the Upper Hearst Development as the plan now stands. We feel that it is too much bigger, taller & massive than the rest of the buildings in this historic neighborhood and will dwarf the existing structures around it. Without any setback, the project comes clear out to the sidewalk, essentially creating a 6-story "wall" along the entire block. It is also aesthetically jarring in how stylistically different it is from the surrounding structures. We ask that the University strongly consider the "Reduced Scale Alternative" instead.



For those of us who live on the Northside, we desperately want to keep the qualities which make Berkeley beautiful and unique. This includes preserving the aesthetic integrity of our historic neighborhood which was founded on the principle of integrating nature and architecture. We ask that the University work with us to preserve this by making the proposed development more integrated in style and proportion.

Regards,

Lisa Lum & Michael Hohmeyer  
1630 Arch St.  
Berkeley, CA 94709

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<PastedGraphic-12.png>

<https://capitalstrategies.berkeley.edu/sites/default/files/draft-supplemental-eir-2020lrdp.pdf>

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Letter IND 122

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**tgtrippe** <trippe321@gmail.com>  
To: planning@berkeley.edu

Mon, Apr 8, 2019 at 10:42 AM

Dear Raphael Breines,

The Upper Hearst Development Project appears too massive and out of character with the surrounding neighborhood, based on the drawings associated with the project. I support campus developments that enhance the vitality of UC Berkeley as long as they preserve and enrich the character of the surrounding neighborhood. This project would fail to do so. Therefore I oppose it.

I support the Reduced Scale Alternative because it is more sensitive to the surrounding neighborhood. The University has succeeded in integrating past developments into the surrounding neighborhood in the past. I believe that the Reduced Scale Alternative would produce another such success.

Sincerely,  
Tom Trippe  
1551 La Vereda Rd., Berkeley 94708

IND  
122.2



Letter IND 123

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comment: Upper Hearst Development Project**

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**Mary Lee Noonan** <mleenoonan@comcast.net>

Mon, Apr 8, 2019 at 3:56 PM

Reply-To: Mary Lee Noonan &lt;mleenoonan@comcast.net&gt;

To: planning@berkeley.edu

Dear Mr. Breines,

I regret that the current design of the Upper Hearst Project demonstrates no sensitivity to the surrounding architecture in its historic neighborhood. I regret that the project does not replace the campus parking that it will eliminate. In both respects, the Upper Hearst Project will have a profoundly negative environmental impact. As a Berkeley resident living north of the campus, I therefore oppose it vigorously.

IND  
123.1

The SEIR's amendment to the 2005 LRDP that would increase the campus population baseline by over 11,000 students is both arbitrary and irrational. The existing student population cannot be adequately housed. It makes no sense to throw over 11,000 more into this "crisis," no matter what Sacramento asks for. Secondly, Berkeley is already one of the densest cities in California. How can its strained infrastructure accommodate such a population increase? Has the City agreed to accept this revision of the existing LRDP? Finally, how can the educational capacity of the University be realistically increased by one third overnight? The amendment is pure politics and pure folly.

IND  
123.2

Sincerely yours,

Mary Lee Noonan

Berkeley, CA



Letter IND 124

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Institute of Transportation Study (ITS) memo on SEIR and questions

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**Alexandre M. BAYEN** <bayen@berkeley.edu>

Tue, Apr 9, 2019 at 5:40 PM

To: planning@berkeley.edu

Cc: Laura MELENDY &lt;melendy@berkeley.edu&gt;, Helen Bassham &lt;hbassham@berkeley.edu&gt;, "Alexandre M. BAYEN" &lt;bayen@berkeley.edu&gt;

Dear Mr. Breines,

Please find attached the memo summarizing the investigation of the SEIR by the Institute of Transportation Studies. | IND  
The specific questions we would like to see answered (also outlined in the memo) are: | 124.1

1. Corrections to the major flaws we found in the analysis of the SEIR and responses to our issues with the SEIR.
2. A process to involve the Institute of Transportation Studies (ITS) (a) either in an oversight capability to help the contractor selected for this analysis; (b) or in a collaborative manner with the contractor as they establish a new SEIR report without the corresponding issues.

Please feel free to contact us if you have any question about the memo.

Please also confirm that you have received the memo by the deadline.

We look forward to working with you on these issues.

Sincerely,

Alex

Alexandre M. Bayen  
Liao-Cho Professor of Engineering

Electrical Engineering and Computer Sciences  
Civil and Environmental Engineering  
642 Sutardja Dai Hall (CITRIS Building), Berkeley, CA 94720-1764  
URL: <http://bayen.berkeley.edu/>  
FLOW: <https://flow-project.github.io/>

Director, Institute of Transportation Studies  
University of California, Berkeley  
Institute of Transportation Studies  
109 McLaughlin Hall, Berkeley CA 94720-1720  
Tel: 510-642-3585  
URL: <http://its.berkeley.edu>

Director, Transportation Initiative  
Lawrence Berkeley National Laboratory  
Faculty Scientist, Mechanical Engineering  
URL: <http://www.lbl.gov/>



Alexandre Bayen  
Director, Institute of Transportation Studies  
Liao-Cho Professor of Engineering  
Electrical Engineering & Computer Sciences  
Civil and Environmental Engineering  
109 McLaughlin Hall, MC 2720  
Berkeley, California 94720-1720  
T: (510) 642-3586 F: (510) 643-3955  
[bayen@berkeley.edu](mailto:bayen@berkeley.edu)

April 8, 2019

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California, Berkeley  
300 A&E Building, Berkeley, CA 94720-1382  
Re: Upper Hearst Development for the Goldman School of Public Policy

Dear Mr. Breines,

I am sending you this memo to express serious concerns about the validity of the final draft of the Supplemental Environmental Impact Report (SEIR) on the Upper Hearst parking structure conversion project.

To begin, we believe that the Upper Hearst parking conversion project addresses important affordable housing issues in Berkeley. In addition, we believe that this project should fully embrace ample sustainable transportation options (beyond those identified in the SEIR) as part of the proposed mitigation measures. While this project would provide new affordable housing for the campus community, many students, faculty, and staff do not live near campus due to affordability issues. This forces many individuals to travel by car given limited cost-effective alternatives (cost and travel time). These impacts should be fully quantified and considered in the mitigation plan to provide equitable solutions for all impacted, including vulnerable populations (e.g., disabled travelers). We believe that a detailed and accurate study of the transportation impacts and mitigation measures is needed and should be included as part of the CEQA documentation process. Our comments herein are not intended to support or oppose the development, but rather to serve as an assessment of the validity of the traffic and transportation analysis provided in the SEIR. ITS Berkeley is a leader in sustainable and innovative transportation options and can provide support to this process and the proposed remedies, if consulted.

Specifically

- 1) We have found major flaws in the analysis of the SEIR, and do not believe that the project can start before these flaws have been corrected, in an amended version of the SEIR.
- 2) We respectfully request that the Institute of Transportation Studies (ITS) be associated to the subsequent analysis, (a) either in an oversight capability to help the contractor selected for this analysis; (b) or in a collaborative manner with the contractor.

IND  
124.2



## Scope

These comments pertain only to traffic and transportation analysis.

## Summary Findings

The reported impact to traffic, trips, and parking is flawed. These flaws stem from incorrect data gathering, and from a misapplication of the data.

Although formal classes at UC Berkeley for the spring semester typically end during the last week of April, the SEIR makes substantial use of data from the month of May. This is not appropriate because May data do not capture typical demand patterns during the semester when classes are in session.

In addition, the study makes a crucial mistake by assuming that fewer trips to the Upper Hearst Development implies fewer trips to the Campus Park (the main campus of UC Berkeley). This is unsubstantiated and likely false. While it is true that removing parking spaces from a garage will mean that fewer car trips can end or begin at the garage, it does not mean that demand for trips to UC Berkeley as a whole will change.

No parking study is provided in the SEIR. The effect of displacing the vehicles that typically occupy the 207 parking spaces to be eliminated is simply not addressed.

Finally, it is worth noting that there has been a marked increase in campus population compared to 2020 LRDP projections. Since basic conditions may have changed, it would be advisable for this SEIR to assess traffic conditions beyond that of a single intersection because impacts may appear on a larger scale.

## Explanation

The flaws in the data and in the logic are described in detail.

## Inappropriate Data

As described on page 165 of the SEIR, data from Tuesday, May 1, 2018 are used to develop average trip generation rates. According to the academic calendar, however, formal classes ended on Friday, April 27, 2018 for the Spring Semester that year. The week from April 30 through May 4, 2018 was designated the Reading/Review/Recitation Week. In other words, the data employed in the SEIR are not appropriate to infer typical trip generation rates during the semester when students attend class.

For reference, according to the UCB Academic Calendars, the last days of class for recent and planned spring semesters are as follows:

Friday, May 1, 2015  
Friday, April 29, 2016  
Friday, April 28, 2017

IND  
124.3





Friday, April 27, 2018

Friday, May 3, 2019

Friday, May 1, 2020

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124.3

Data collection should be performed in the middle of the semester and cover more than one day as class schedules vary across weekdays.

### Traffic volume trends: Intersection Volume and LOS Comparison

Regarding overall traffic conditions in Berkeley, page 167 of the SEIR claims, "The total intersection volumes in 2015-2018 are on average about 11 percent lower during the AM peak hour and 16 percent lower during the PM peak hour than in 2002." This claim is problematic and the data do not support the implication that traffic conditions are improving.

The claim rests on the table in Appendix B of Appendix G (page 752 in the PDF version of the SEIR). This page displays a summary of volumes, delays, and LOS at 29 intersections in Berkeley. Of the 29 intersections included in this analysis, five of them utilized counts near and around campus from May of 2018 or 2015. For these five intersections, volumes were typically down by 30%. As above, this apparent reduction in volume can be explained by the fact that classes typically end during the last week of April.

IND  
124.4

The comparison of 2002 data with 2015 through 2018 data do not appear to take into account any seasonal variations and are therefore not appropriate to infer trends.

One particularly incongruous feature in the 2015 through 2018 data is that although volumes decreased, delays increased. In fact, for the AM peak hour in the 2015-2018 period, 15 out of the 29 intersections had greater delay than in 2002. The increased delay and reduced flow could be an indicator of worse traffic congestion, a commonly known phenomenon well modeled in the transportation literature.

### Incorrect Logic

Based on the wrong data, the SEIR makes an invalid conclusion on page 168, "the trip generation analysis provided above estimates that the Upper Hearst Development would reduce existing AM peak-hour traffic by 15 vehicle trips and PM peak-hour traffic by five vehicle trips. Therefore, it would not considerably contribute to the 2020 LRDP program's significant and unavoidable impact on traffic flow. The Upper Hearst Development would have a less than significant impact on the performance of the circulation system."

IND  
124.5

More harmful than the wrong data is the wrong logic. The argument in the SEIR is as follows:

- A reduced number of parking spaces results in fewer trip origins and destinations
- Fewer trips to the Upper Hearst Development implies fewer trips to the Campus Park
- Existing peak-hour traffic would be reduced

The logical fallacy is that fewer trips to the Upper Hearst Development does not imply fewer daily trips to the Campus Park. The trips that currently end or begin at the Upper Hearst Parking Structure will not



disappear into the ether, they will be displaced to another parking facility. The overall effect on VMT and LOS in the area is not clear.



### Parking Study

No parking study is provided in the SEIR. However, this is very important since most parking facilities near campus operate at capacity. Some of them in the past have used double lane parking, operated by attendants. For example, the lower level of the Lower Hearst parking structure fills up around 8:30am daily, leading to overflow to the upper Hearst parking structure. The remaining parking structures may not be adequate to compensate for the 207 eliminated parking spaces (given that the Upper Hearst is already an overflow lot from the lower Hearst). If parking spaces in the new development are reserved for residents then the effect will be even more severe.

Many individuals who come to campus already try to park on nearby residential streets, particularly if they are only coming for a short period. This problem may worsen with the elimination of parking. The ability for people to go to mid-day meetings outside of campus will become impossible during business hours, due parking overflow, and result in more VMT.

Similarly, in the case of executive programs or special events with attendance levels of up to 300 people, driving and taxis are the primary means of transport to campus for both local attendees and those staying in hotels downtown. A lack of sufficient parking can be an issue during these events.

Additionally, there is very little information in the SEIR regarding the actual plan for parking mitigation during the 23 months of construction. During this time 350 parking spots will be removed. There is a requirement vaguely described in the LRDP TRA-3-a and TRA-3-b, but no concrete plan.

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124.6

### Increased Population and its Effect on Traffic

Project EIRs are tiered as supplements under the LRDP EIR, which means that the supplemental EIRs can focus on new issues that were not covered earlier or changes in conditions that make previous analyses and mitigations inadequate or moot.

However, the campus population is much higher than what was projected. Student enrollment for 2020 is 11,000 greater than the initial estimate while the number of employees is 1,000 lower. This overall growth in population can generate substantial traffic and other environmental impacts. In addition, the campus is about 1,500 beds short of what was to be available by 2020. This exacerbates the issue. Despite all of this, the SEIR concludes: "The proposed Upper Hearst Development, along with the increased campus headcount baseline, would add to the population of Berkeley and the greater Bay Area region, beyond levels anticipated in the 2020 LRDP EIR. However, this population increase would not result in additional environmental impacts beyond those anticipated in the 2020 LRDP EIR related to noise, public services, and traffic."

In this SEIR the focus is on one intersection, Hearst and Gayley. However given the magnitude of the population change and the non-linear nature of traffic, impacts of the development may not be contained to such a small scale.

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124.7





In conclusion, we believe that a correct traffic and transportation analysis is necessary for planning purposes; the Institute of Transportation Studies will be delighted to help you with this analysis, to produce a proper final version of the SEIR.

Sincerely,

A handwritten signature in blue ink, appearing to read "Alexandre M. Bayen".

Alexandre M. Bayen  
Liao-Cho Professor of Engineering  
Director, Institute of Transportation Studies

CC: Dean Liu, CoE

CC: Chancellor Christ  
Provost Alivisatos  
Vice-Provost Alvarez-Cohen  
Chair Spackman



Letter IND 125

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Justin Staller** <justin.m.staller@gmail.com>  
To: planning@berkeley.edu

Tue, Apr 9, 2019 at 3:20 PM

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California Berkeley  
300 A&E Building  
Berkeley, CA 94720-1382  
[planning@berkeley.edu](mailto:planning@berkeley.edu)

As a Cal alumni and someone very frequently in the neighborhood, I am excited to see the proposed development for the new academic building on Hearst Avenue. I support the academic and housing facilities, which do not appear too burdensome and will not overwhelm the neighborhood, and which will greatly improve the quality of life of many individuals in the neighborhood.

The proposed project is correctly scaled, it's height is perfect, and I find it to be very attractive. Please do not revert to the Reduced Scale Alternative. Why do something poorly when you could do it right?

It would be great to see the larger project (rather than the diminished-scale proposal) implemented. The design looks really great, modern and yet harkening back to classical Roman architecture at the same time, like many of the buildings on the UC Campus.

It would be really nice to see some modern renovations in the rundown neighborhoods surrounding the UC Berkeley campus.

Cheers,  
Justin Staller

IND  
125.1



Letter IND 126

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Stop cutting down trees!

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**juty blue** <jutyblue@yahoo.com>

Tue, Apr 9, 2019 at 1:20 PM

Reply-To: juty blue <jutyblue@yahoo.com>

To: "planning@berkeley.edu" <planning@berkeley.edu>

with the horrible overly developed construction you continue to slam the city of Berkeley with, the trees you cut contribute to climate change, as trees actually help clean the air!

Stop cutting trees, stop developing so much and just calm down. You don't need more students and development, try keeping the environment cleaner and safer for the students lungs you already have. Try that for awhile instead of killing more innocent trees, and polluting with all the vile construction you seem to bent on, as it contributes bad health effects to the students lungs and respiratory.

Thank you for your consideration of my idea,

Ms. Blue

Berkeley resident for 30+ years

IND  
126.1



DEPARTMENT OF MATHEMATICS

BERKELEY, CALIFORNIA 94720-3840

April 10, 2019

Dear Senior Planner Breines,

Recently, I attended the open meeting about the Goldman Institute plans. Here are some remarks.

The plan to demolish the Upper Hearst parking structure this September came as a complete surprise to me. I park there daily and a windshield flier on March 12 was your very first notice to the public. As far as I can tell there was no outreach to those faculty whose UC lives would be affected – the hundreds of faculty who work in Engineering and Math Departments. Zero outreach.

Under the announced plan, faculty parking would be permanently cut by more than half, and the first word we have about it is now? The Upper Hearst lot is often so full that stack parking is necessary, and the plan is to reduce the capacity by more than half? That's appalling.

How can such a major plan be made that does not take into account the needs of the faculty who work on this quadrant of the campus? Were we even consulted? I don't think so. Were we informed in a timely manner? I don't think so.

Although the SEIR mentions the parking disruption, it is vague on the details. But the details are crucial. Various "hopes," "maybes," and differing parking figures appear in the plan, related emails, etc., but nothing definitive. A plan like this must be definite, not vague. How else can it be debated? Here are some questions that should be answered in detail, specifically, and exactly, before a Goldman plan is discussed further, let alone implemented.

1. Under the current plan, exactly how many parking spaces will be set aside for faculty (C permits), how many for staff (F permits), how many for faculty or staff (C or F) permits, how many for residents, and how many for special permits such as maintenance, electric vehicles, and departmental reservations. The exact figures please.
2. Exactly how do the proposed figures compare to the current ones? Not estimates, but exact numbers.
3. Will the permits in the Lower Hearst parking structure be revised to make up for some lost spaces in the current Goldman plan? In particular, will this happen by September? Yes or no, and if yes, by exactly how many?
4. What about revisions of the permits in the Boalt lots near Minor Hall and the Bancroft structure?
5. How many C permits will be made available in the pay parking on Gayley?

I know there are other controversial issues about the Goldman proposal that merit discussions and investigation, such as the financing by means of market rate housing rentals. But parking is my issue. In Clark Kerr's perceptive words,

"I find that the three major administrative problems on a campus are sex for the students, athletics for the alumni, and parking for the faculty."

I await answers to my preceding five questions.

Sincerely,

Charles Pugh

IND  
127.1

DANIELLA THOMPSON  
2663 LE CONTE AVENUE · BERKELEY, CA · 94709

Letter IND 128

11 April 2019

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California, Berkeley  
300 A&E Building  
Berkeley, CA 94720-1382

Re: Draft Supplemental EIR, 2020 LRDP/Upper Hearst Development

Dear Mr. Breines,

The following comments are provided in addition to the comments I made in person at the public hearings on 12 March and 21 March 2019.

**1. The SEIR failed to provide realistic development alternatives to the proposed project.**

While both the No Project Alternative and the Off-site Lease Agreement Alternative appear to be within the realm of possibility (although Dean Brady and his Goldman School staff vociferously dispute it), the two built alternatives offered in the SEIR constitute little more than window dressing.

The Academic Building Only Alternative has so far failed to raise the funds needed to finance the project, while the Reduced Scale Alternative, which the community is supporting, may not “pencil out” for the developer.

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128.1

**2. The SEIR is not transparent about funding sources for the proposed project.**

A paragraph on page 42 informs, “Because the Upper Hearst Development was not anticipated in UC Berkeley’s Capital Financial Plan and the overall cost of the Project would exceed \$10 million, review of the Project by The Regents is required.” For additional information, sharp eyes must find the video of the UC Regents’ Finance and Capital Strategies Committee meeting of 13 March 2019: <https://youtu.be/VovrsqDc3AY>

UC Berkeley Vice Chancellor of Finance Rosemary Rae told the committee that the Upper Hearst Development Project will be financed via a public-private partnership, with American Campus Communities (ACC) acting as developer and manager. This suggests that all other financing possibilities have been discarded and calls into question UC’s good faith in offering the project alternatives mentioned in item 1 above.

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128.2

**3. The SEIR gives short shrift to the historic significance of the Northside neighborhood.**

Vice Chancellor of Finance Rosemary Rae told the Regents’ Finance and Capital Strategies Committee that in developing the Upper Hearst project, the Berkeley campus is “being sensitive to

IND  
128.3

the residential community,” and that the project “will act as a transition” between the high-use campus and the residential neighborhood. In fact, the SEIR treats Daley’s Scenic Park as a non-entity to be ignored. Chapter 5, which purports to offer a review of the cultural resources surrounding the project area, omits dozens of historic structures that survived the 1923 Berkeley Fire and later depredations by the University of California. It fails to mention half a dozen designated landmarks located less than a block away from the project site. And it is amiss in describing the historic architectural styles of this neighborhood, where the “Berkeley Brown Shingle” and the local Arts & Crafts style originated in the 1890s. See the Berkeley Architectural Heritage Association’s comments of 11 March 2019 for full details.

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**4. The project’s inappropriate style and scale run contrary to professed objectives.**

The project’s architect has made it clear to community members who engaged him that he had not visited or studied the Northside neighborhood and had no interest in trying to make his design compatible with the neighborhood’s scale and fabric. This attitude, and the resulting project design, flout one of the Project Objectives spelled out on page 19 of the SEIR: “**Design and build facilities that aesthetically enhance the City and the campus vicinity over existing conditions and that are compatible with the surrounding neighborhood.**”

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The community’s consensus is that the project as designed utterly fails to meet the stated objectives of aesthetic enhancement and compatibility with the surrounding neighborhood.

**5. The SEIR fails to provide evidence justifying the scale of the proposed academic building.**

No concrete evidence has been provided as to why a small school such as Goldman requires an additional 40,000 sq. ft. of space, and why Goldman can’t take advantage of the ample space in nearby UC facilities.

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**6. The proposed academic building is an architectural ego trip.**

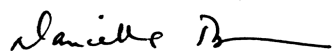
Not only does the proposed building encroach on the designated site of the landmark Beta Theta Pi Chapter House, it bears not the slightest visual connection to it, foisting yet another unsightly UC presence on beleaguered Hearst Avenue. A school that prides itself on its prestige should have no need for the visual chest-pounding that the proposed building represents.

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In summation, I hope that UC will be sincere in seeking a way to implement the Reduced Scale Alternative, and that the design of both academic and residential buildings is altered to meet the Project Objectives as outlined in the Draft SEIR.

IND  
128.7

Sincerely,



Daniella Thompson



Letter IND 129

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Lisa Titus** <titusmcdonnell@gmail.com>

Thu, Apr 11, 2019 at 12:28 PM

To: planning@berkeley.edu

RE: Opposition to Upper Hearst Development Project and support for reduced scale alternative

Planning Committee,

Although I support additional student and faculty housing and have no objections to an expansion of the Goldman School, the proposed project is too massive, too tall, and very poorly designed.

The proposed project includes a large new academic building on Hearst Avenue and a massive apartment building that will extend the whole block of La Loma Avenue between Hearst Avenue and Ridge Road. The apartment building would be 5- to 6-stories (72 feet) high and of a totally inappropriate design for this historic neighborhood.

The Draft Supplemental Environmental Report (SEIR) offers a **Reduced Scale Alternative** to the proposed project:

*"By reducing the floor area of new buildings, the academic building's height would be reduced from four to three stories, while the residential building would be reduced from up to six to four stories. The new buildings would have increased setbacks from streets relative to the proposed Project."*

I support the **Reduced Scale Alternative** and oppose the Proposed Project.

Thank you,

Lisa Titus  
1705 La Loma Ave  
Berkeley 94709

IND  
129.1



Letter IND 130

Planning Departmental &lt;planning@berkeley.edu&gt;

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## The Upper Hearst Development Project

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**Carmel Hara** <carmelhara@gmail.com>

Thu, Apr 11, 2019 at 7:45 PM

To: planning@berkeley.edu

The Upper Hearst Development Project does not seem sufficiently thought out for the neighborhood and architecturally appropriate.

Carmel Hara

2711 Virginia Street

Berkeley CA 94709

Sent from my iPad

IND  
130.1





Letter IND 131

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Upper Hearst CEQA: Negative impacts of UCB's enrollment increases**

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**Jeff Angell** <jda1952@comcast.net>  
To: planning@berkeley.edu

Thu, Apr 11, 2019 at 8:07 PM

There have been unmistakable and unpleasant impacts on our neighborhood (south campus/Elmwood) and on Berkeley generally from the excessive growth of UC enrollment. Within an half-block of our home, two family homes have been converted into minidorms: Where families previously lived, unsupervised groups of up to 14 students now live in both properties. For both, countless calls to the police have been needed – for years! – to rein in noisy parties. End-of-term street dumping of furniture has become a norm, as have littered and poorly-maintained front yards. (Apart from the clear impacts of this overcrowding, it's difficult to escape concluding that UC has encouraged slumlord behaviors!) Finally, neighborhood parking impacts have been as one would expect: negative and severe!

IND  
131.1

Jeff Angell

Piedmont Avenue



Letter IND 132

Planning Departmental &lt;planning@berkeley.edu&gt;

## Comment on Draft Supplemental EIR for the Upper Hearst Development

Joan and Jeff <joanandjeff@comcast.net>  
To: planning@berkeley.edu

Thu, Apr 11, 2019 at 8:59 PM

Dear Planning Department Staffer:

I attended the meeting that was held at University Hall to allow public comment on the Draft EIR for the planned development of the GSPP. I agreed with the comments made by most of the audience members.

I went to Cal from 1971-75, living in the South Campus area, moved to North Oakland for ~12 years, during which time I was in grad school at Cal for 3 years, then moved back to the South Campus area about 27 years ago—so I have seen many changes occur during my time here. It is most disingenuous of you to say that the increase in numbers of students at Cal has no effect on the surrounding neighborhood. The increase in traffic (and in aggressive driving), difficulties in parking, increase in noise from groups of students, and increase in improperly discarded trash and street dumping are only a few of the changes I have seen. Since we have lived here, two formerly single family homes within a one-block radius of us have been turned into mini-dorms in which 14-16 students live, and other group housing has more residents than in prior years. We neighbors worked together to help get the mini-dorm ordinance passed to try to place limits on this sort of “solution” to Berkeley’s housing crunch, which has helped somewhat to decrease the problems caused by these residences. Because the University has not provided housing to keep pace with the growth in student numbers, there is significant incentive for unscrupulous landlords to offer substandard living conditions to students. And the competition for housing is so fierce that non-students who want to live in Berkeley have a hard time finding places to live, as well. I understand that GSPP has outgrown its current facilities, and needs more space, but I am not confident that the design, which includes large conference spaces, is appropriate for the site involved.

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132.1

Much as I love living near the University, it has been an inconsiderate neighbor. The University has not adhered to the Covenants it agreed to when the Clark Kerr Campus became a dorm. It has not kept to its agreements about numbers of students. It is not able to adequately monitor & control the behavior of its fraternities & sororities. I’m not sure why we should believe that the University will adhere to its plans now. More time for public comment and involvement, as well as assessment of impact on the surrounding community, is needed.

IND  
132.2

Sincerely,

Joan King-Angell BA 1975, MS 1983

2605 Piedmont Ave.

Berkeley, CA 94704



Letter IND 133

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Kevin Läufer** <laeufer@berkeley.edu>  
To: planning@berkeley.edu

Thu, Apr 11, 2019 at 3:54 PM

Hi,

as a PhD student in the EECS department I would like to comment on the Upper Hearst development project.

IND  
133.1

In light of the lack of space and affordable housing in Berkeley, I strongly believe that parking lots are a huge waste of precious space.

For people who absolutely have to commute by car it might be a good idea for the University to point out any Park&Ride opportunities which would allow students and employees to leave their cars parked outside of the city, taking a bus for the last couple of miles.

IND  
133.2

However, while I support demolishing the parking lot, I would like there to be more transparency on how the apartments that will be built are going to be affordable for students. Is the University going to be the owner of the apartments or will they be owned and managed by a private developer? In order to keep housing for students affordable it is important that UC Berkeley owns the apartments instead of wasting students' money through public private partnerships.

IND  
133.3

Thanks,  
Kevin Läufer

Upper Hearst Parking Garage Demolition

LEKA GOPAL <lekagopal@berkeley.edu> Thu, Apr 11, 2019 at 9:11 PM

To: Planning Departmental <planning@berkeley.edu>

Hi,

I'm writing regarding the demolition of the Upper Hearst Parking Garage, with input why I believe it should not be demolished. Ultimately, I am aware whatever decision will be made by UC Berkeley and the Physical & Environmental Planning department, but I would like to provide some comments against it:

- Parking already — especially for students, but also faculty and staff — is incredibly hard to come by. I have had days where I am driving around for 45 minutes between all the parking lots just to find a space, and some days I am unable to find on at all. Especially with rent prices in Berkeley soaring, many students are choosing to live out of Berkeley, causing commuting and drivers to increase, which requires parking space. The Upper Hearst lot is already one of the bigger lots — what will happen when it's gone?
  - I would also like to point out the revenue coming into the college from these lots, through hourly public parking spaces. What will happen when the lot is demolished?
  - The Goldman School does not need a space that takes up that much space in Berkeley, and, if it did, why not somewhere on campus, or perhaps even the 2223 Fulton St site that was demolished? There must be other options.
  - Finally, the cost of demolition and rebuilding of a new building will not only take a significant amount of time, but also a significant amount of money, which could be used for things such as housing homeless students, providing better on-campus services, or updating the current buildings on campus that are falling apart.
- IND 133.1

IND 133.2

IND 133.3

IND 133.4

I implore you to think about the well-being of the students and staff that this demolition will affect. I hope you are all able to come to decision that is beneficial to the majority of people, instead of a small few.

Thank you so much for your time.

Best,

Leka Gopal

[lekagopal@berkeley.edu](mailto:lekagopal@berkeley.edu)



Letter IND 135

Planning Departmental &lt;planning@berkeley.edu&gt;

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**To Raphael Breines, Senior Planner**

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**Paulo J.M. MONTEIRO** <monteiro@berkeley.edu>  
To: Planning Departmental <planning@berkeley.edu>

Thu, Apr 11, 2019 at 3:00 PM

Dear Mr Breines,

I am truly concerned with the demolition of the Upper Hearst Parking Garage. I understand the excellent reasons for the demolition but the proposal solution is inadequate and will cause significant distress to the affected faculty and staff.

I'm amazed by the lack of vision of the proposed solutions described by the Provost's letter. It's wishful thinking, in the best interpretation, that the Clark Kerr parking is a realistic and fair option. The concept of a shuttle between the parking located at the top of an earthquake fault is poorly defined.

I don't have the option of coming to campus by public transportation so I imagine the frustration of the daily hunting for parking.

Please reconsider the dealing the demolition until a proper engineered solution is found.

Thank you,

Paulo Monteiro

IND  
135.1

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Paulo Monteiro*Roy W. Carlson Distinguished Professor*

Department of Civil and Environmental Engineering

U.C. Berkeley



Letter IND 136

Planning Departmental &lt;planning@berkeley.edu&gt;

## Public Comments: Upper Hearst Development Project

Peter &lt;peterh@berkeley.edu&gt;

Thu, Apr 11, 2019 at 3:23 PM

To: UC Berkeley Planning &lt;planning@berkeley.edu&gt;

Dear planing department

Please see my questions for the projects below:

1. Eliminating more than 300 parking spots for faculty and staff will make it significant harder for economically challenged members of our community to work at UCB. Other parking options are more expensive or so far away that it is impractical to use. Considering these aspects I have the following questions: | IND 136.1

1.1. How are retention cases going to be addressed for people who have to commute ? is the campus or GSPP paying for the costs of those? Are faculty and staff who have to park miles away at Clark Kerr getting reimbursed from GSPP for the lost time? | IND 136.2

1.2. How are inequality issues going to be addressed. Lower income staff will be significantly harder hit by this measure than well payed employees since most commuters are not high income? In the spirit of equal opportunity employer this does not create equal opportunities. How does the campus explain to lower income families that they have to give up 1-2h every day for high end rental units? | IND 136.3

1.3. Is the campus or GSPP providing the funds to compensate employees for the higher cost parking spots offered and the time lost? | IND 136.4

2) What will the rent be at these units? Faculty and staff cannot afford market rate housing. The whole point of faculty housing is that it is below market rate. There is no advantage of living in these units if they are not significantly below market rate. | IND 136.5

3) Will faculty and staff of GSPP have reserved parking in the remaining parking areas? If yes explain why they are getting special treatment over other faculty and staff. | IND 136.6

Best regards

Peter

--

Dr. Peter Hosemann

Professor and Department Chair  
Department of Nuclear Engineering  
University of California Berkeley  
4151 Etcheverry Hall  
Berkeley, CA, 94720

Lawrence Berkeley National Laboratory (LBNL)  
Faculty Scientist  
Material Science Division

Nuclear Materials Group:  
<http://materials.nuc.berkeley.edu/>

Phone: (c) 510 717 5752  
[peterh@berkeley.edu](mailto:peterh@berkeley.edu)



Letter IND 137

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Rehana Kaderali** <rak5@berkeley.edu>

Thu, Apr 11, 2019 at 2:23 PM

To: planning@berkeley.edu

Dear Mr. Breines,

Like many of my neighbors in Northside, I support CAL's need to provide additional student and faculty housing and to expand the Goldman School.

My very strong request is that you consider the Reduced Scale Alternative as outlined in the SEIR; A structure of 5 or 6 stories would greatly overwhelm our neighborhood.

The alternative plan, with an academic building of 3 stories, residential building of 4 stories and increased setbacks is much more in harmony with the size and height of other structures in our beloved neighborhood.

I thank you for your time and consideration,

Sincerely,  
Rehana Kaderali  
Lecturer and Resident of Ridge Rd.

IND  
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Letter IND 138

Planning Departmental <planning@berkeley.edu>

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## Public Comments: Upper Hearst Development Project

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**Rhonda L. RIGHTER** <rrihter@berkeley.edu>  
To: planning@berkeley.edu

Thu, Apr 11, 2019 at 2:35 PM

I'm all in favor of projects that provide more housing for faculty and others, even at the expense of parking.  
Rhonda Righter

| IND  
138.1





Letter IND 139

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Scott Hart** <scott\_hart@berkeley.edu>

Thu, Apr 11, 2019 at 4:29 PM

To: planning@berkeley.edu

Demolish the Upper Hearst parking structure! Remove it. Create new academic space for the Goldman School of Public Policy and new rental housing for faculty

IND  
139.1

Do it.

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Go Sharks,

-Scott Hart



Letter IND 140

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Alan Bolind** <bolind@berkeley.edu>

Fri, Apr 12, 2019 at 4:37 PM

To: planning@berkeley.edu

Dear Planning,

I am opposed to the Upper Hearst Development Project because (1) it reduces parking, (2) it does not help the housing problem, and (3) it wastes the university's land resources.

(1) and (2) The long-term loss of parking (over 200 spaces) is unacceptable, given that no plans are made to replace these spaces in a nearby (walking distance) parking area. The high cost of local housing means that staff and faculty must find affordable housing farther and farther from campus. These persons likely must drive, because the affordable housing is located far from BART and other public transportation. These persons therefore need places to park near campus. But they can't if you take away their parking. And the creation of housing on this site does nothing to help this problem because the housing will be offered *at market rate*. The whole point is that our staff and faculty cannot afford market rate! The argument that this Upper Hearst Development Project will help solve the campus housing problem is therefore almost totally false.

(3) Campus needs space for more academic-related buildings. By tying up this land with market-rate housing, the campus squanders this land resource.

Regards,

---

**Alan Bolind, Ph.D.**

Safety Coordinator for the Department of Nuclear Engineering and the College of Engineering

University of California, Berkeley | 4163 Etcheverry Hall | Berkeley, CA 94720-1730 | [bolind@berkeley.edu](mailto:bolind@berkeley.edu) | (510) 642-5015IND  
140.1



Letter IND 141

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Benjamin Brock** <brock@cs.berkeley.edu>  
To: planning@berkeley.edu

Fri, Apr 12, 2019 at 10:49 AM

I'd just like to write briefly to share my comments on the Upper Hearst Development Project.

Firstly, I **support** using our limited campus space to support people rather than cars. I think developing the Upper Hearst parking for academic and residential space supports this goal.

However, I'd like to point out that **building market-rate housing is problematic**, given that the market rate for a 2 bedroom apartment in Berkeley is \$3,800, well out of the reach of students.

I do understand the need to build housing for faculty, and I support using some of the space for that. However, I'd like to voice my support for building **high-density, low-cost student housing**. Think 300 ft^2 and smaller studios, as are common in other cities with high population densities.

Ben

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Letter IND 142

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public comments: Upper Hearst Development Project

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**Crystal Huang** <chchuangucd@gmail.com>

Fri, Apr 12, 2019 at 7:01 PM

To: planning@berkeley.edu

Cc: Henry DeNero &lt;htdenero@gmail.com&gt;

Dear UC Berkeley Planning Department,

I am emailing on behalf of residents 4 blocks away from the proposed Upper Hearst Development Project at 2670-2672 Hilgard Ave. When I heard about the published Draft Supplemental Environmental Impact Report (SEIR) addressing the project and the public hearings being held on March 12 and 21, through my neighbors, I was shocked to learn that such a massive proposal was not even in the neighboring residents' radar.

Plans like this can do a severe impact on the neighborhood, especially one that is historic like ours. Although we support additional student and faculty housing and have no objections to an expansion of the Goldman School, the proposed project is **TOO MASSIVE, TOO HIGH, and POORLY DESIGNED**.

As neighbors in this community that is intricately connected to each other, there is a long of long-term benefit for us to work together than creating opportunities for friction. We are reaching out to you as residents of the Northside neighborhood to please implement the Reduced Scale Alternative and **design it with greater sensitivity for the scale and historic fabric of the nearby residential blocks**.

It takes all of us to build a beloved community. Please don't rush through the process and risk destroying this fabric of our home.

Sincerely,

Chauru Huang  
[chchuangucd@gmail.com](mailto:chchuangucd@gmail.com)  
+1-530-574-6939

IND  
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Letter IND 143

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Project and 11,285 Student Enrollment Increase Project

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David Shiver <dshiver@bae1.com>

Fri, Apr 12, 2019 at 8:34 AM

Reply-To: dshiver@bae1.com

To: planning@berkeley.edu

Cc: pbokovoy@aol.com, galeg@berkeley.edu

Dear Mr. Breines:

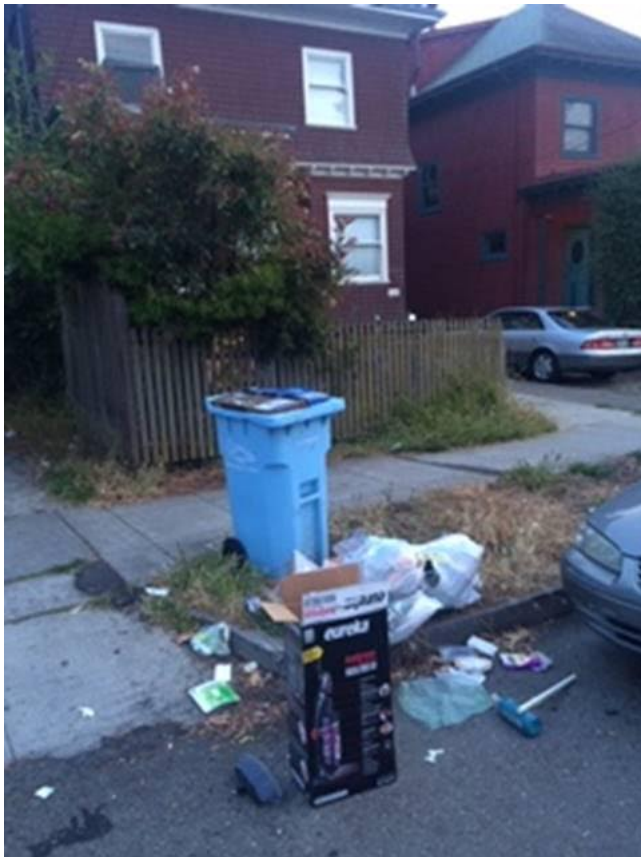
I am a resident at [2428 Stuart Street, Berkeley, CA](#) on the southside of the UC Berkeley campus.

I would like to submit the following sampling of photos that I took of garbage on the street or front yard of two properties primarily occupied by UC Students, a duplex at 2424 and 2426 Stuart Street and a single family home at 2422 Stuart Street. I know that the occupants were UC Students from discussions I had with the property owners and neighbors.

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The Draft SEIR aesthetics section evaluates only the aesthetics impacts on the community and students from construction and operation of the Goldman School from increases in scale, massing, and lighting on recognized scenic resources and on "neighborhood building design compatibility." There is no evidence that either the 2005 EIR or the Draft SEIR assessed the effect of increases in student enrollment, including past increases that are over and above the increase of 1,650 students projected in the 2005 EIR for the 2020 LRDP and expected future increases, on the surrounding community caused by increases in the number of students living off-campus and the associated increase in visual impacts from improper trash disposal and littering.

Photographic documentation of the impacts:







The Draft SEIR noise section evaluates only the noise impacts on the community and students from construction and operation of the Goldman School from construction activities and increases in traffic. However, this approach understates potential noise impacts associated with the proposed increase of 11,285 students (including past increases that are over and above the increase of 1,650 students projected in the 2005 EIR for the 2020 LRDP and expected future increases) who would live primarily off-campus in private housing.

In addition to aesthetic impacts documented above, UCB students living off-campus in private residential neighborhoods generate a high level of noise after 10 p.m. These two properties have been cited one or more times by the City of Berkeley for loud and unruly parties and I have had to make dozens of calls to the Berkeley Police Department non-emergency number to have an officer respond to noise incidents after 10 p.m. Students have disturbed the sleep of

A-701

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4/12/2019

UC Berkeley Mail - Public Comments: Upper Hearst Project and 11,285 Student Enrollment Increase Project

myself, my young son, and a boarder. I have suffered economic losses as a result of lost productivity from the actions by UCB students who do not respect community standards for noise and garbage. ↑

David Shiver

2428 Stuart Street





Letter IND 144

Planning Departmental &lt;planning@berkeley.edu&gt;

## Public Comment on Upper Hearst Project -- Question set A

**D Buckwald** <dbuckwald@hotmail.com>  
To: "planning@berkeley.edu" <planning@berkeley.edu>

Fri, Apr 12, 2019 at 3:35 PM

Doug Buckwald  
2646 Dwight Way  
Berkeley, CA 94704

April 12, 2019

### ENABLING CAMPUS POPULATION STABILITY: To be or not to be...?

The very first goal identified in the Development Program outlined in UC Berkeley's 2020 LRDP is:

**"STABILIZE ENROLLMENT AT A LEVEL COMMENSURATE WITH OUR ACADEMIC STANDARDS AND OUR LAND AND CAPITAL RESOURCES"** (p. 13).

The LRDP projects an additional 4,000 students over the baseline enrollment, and states that enrollment "should stabilize" by 2010.

[T]he Final EIR indicated a student headcount of 31,800 and total regular-term campus headcount of 45,940 for academic year 2001- 2002, and projected an academic year 2020 student headcount of 33,450 and total regular-term campus headcount of 51,260. As discussed in Section 3.1.5 of the 2020 LRDP Final EIR, it was anticipated that the student enrollment would level off and stabilize at 33,450 by the year 2010.

As of the publication of the Notice of Preparation for this SEIR in August 2018, UC Berkeley's student enrollment was 40,955 and the total campus headcount was 57,637, both of which exceed the projections described and analyzed in the 2020 LRDP Final EIR (as shown in Table 4 below). The 2017-18 year student enrollment of 40,955 exceeds the 2020 LRDP projection by approximately 7,500 students. [DSEIR for Upper Hearst]

**Question #1:** Please describe any and all specific steps that the University took to stabilize UC Berkeley's student enrollment at 33,450 and so remain in accordance with the 2020 LRDP projections.

**Question #2:** Please specify the departments and officials who were responsible for each step (if any) to limit enrollment in excess of the LRDP projections.

**Question #3:** Please declare and explain the results of the efforts (if any) that were made to minimize excess enrollment.

**Question #4:** Did any official or staff member at UC Berkeley ever communicate any concerns to another UC official or staff member about the fact that the University's enrollment was vastly outpacing the limits set in the 2020 LRDP? If so, please reproduce any and all such communications here.

**Question #5:** Does the University have any formal review process in place to ensure compliance with the 2020 LRDP? If so, please describe the process in detail and include the results (if any) of the periodic reviews relating specifically to campus population.

**Question #6:** If no specific and dedicated efforts were made to minimize excess student enrollment, please so state.

\*\*\*

UC Berkeley has been requested to evaluate the ability to grow by 4,000 full time equivalent students over base year 1998 by 2010. This represents an increase in enrollment of roughly 13%: a significant increase for any campus, but particularly for a mature, urban campus with aging facilities and limited capacity to expand. However, once our current target is reached, at an estimated two-semester average of 33,450 students, enrollment at UC Berkeley should stabilize. [2020 LRDP]

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**Question #7:** Does UC still consider a **13% increase** in enrollment (compared to the base year 1998) to be a "significant increase"? If so, how does UC characterize the current student enrollment level, which at 42,519 represents a **44% increase** above the 1998 baseline? [UC By the Numbers]

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**Question #8:** Does UC Consider a **44% increase** in the student population on campus to be a substantial deviation from the guidelines set forth in the 2020 LRDP?

**Question #9:** Does UC believe that substantial deviations from the guidelines established in the 2020 LRDP can be justified by simply announcing that the deviations occurred, or does UC believe that a Supplemental EIR should be required to account for them? (Please bear in mind that previous non-controversial changes with limited impacts were deemed to require an Amendment at a minimum.)

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**Question #10:** In the 2020 LRDP, UC cites (as a reason to limit enrollment increases) the fact that UC Berkeley is a "mature, urban campus with aging facilities and a limited capacity to expand." Do UC planners still believe this characterization was accurate at the time it was written? If so, is it safe to say that the campus is now (two decades later) even more mature, has facilities that have aged even further, and has an even more limited capacity to expand?

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Not only do few undeveloped sites remain on and around the campus, but our capital resources are also very limited. What capital funds the campus does receive from the state are consumed largely by seismic upgrades to existing buildings, and this need will continue for the near future. Moreover, to the extent university land and capital are utilized to accommodate further enrollment growth, they can no longer be utilized for campus renewal. Yet, the renewal of our buildings and infrastructure is crucial to our ability to recruit and retain exceptional individuals, to pursue new paths of inquiry and discovery, and to maintain our historic standard of excellence. [2020 LRDP]

**Question #11:** Does UC still experience capital limitations such as described above or similar? If so, please clarify the trade-offs that are being made that currently harm UC's facility maintenance, infrastructure, and campus renewal due to capital that is diverted to accommodate enrollment growth. Please identify every department or service that has been affected by this and specify the harm that has been done. Include budget figures wherever possible to point out the shortfalls in funding that would be considered adequate.

**Question #12:** Does UC still believe that its "historic standard of excellence" is threatened by the financial implications of excessive enrollment growth? If so, clarify the steps that should be taken to address this problem. If not, please describe land-use and capital availability conditions that have changed appreciably since the 2020 LRDP was adopted and now eliminate the harm caused by excessive enrollment.

\*\*\*

**Question #13:** Speaking of capital limitations, please provide the specific yearly expenses that UC Berkeley incurs as a result of its decision to rebuild California Memorial Stadium and the Student-Athlete High Performance Center on top of the Hayward Fault. Please include: (a) the current annual interest payments; (b) the date when the repayment of the principal must begin; (c) the total principal still owed; and (d) any other financial details that impact university costs associated with the stadium.

**Question #14:** Please specify if any portion of student fees or tuition will go towards paying off this debt. If so, how much of total student tuition and fees is currently used for this purpose, and how much will be used in the future?

Please refer to the following article:

<http://www.dailycal.org/2018/01/17/central-campus-take-chunk-cal-athletics-debt/>

"UC Berkeley will take on 54 percent of the approximated \$440 million debt stemming from the Memorial Stadium renovation as well as the Simpson Student-Athlete High Performance Center, according to Chancellor Carol Christ in a recent interview with the Mercury News."

**Question #15:** When will the debt from these projects be entirely retired? What will be the final cost of the of both projects after the principal and all interest payments (including any penalties) have been made?

**Question #16:** Is there any pressure felt inside the University to enroll an increasing number of out-of-state and foreign students (who pay significantly higher tuition and fees) in order to help alleviate the impact of these debts -- either directly or indirectly?

4/12/2019

UC Berkeley Mail - Public Comment on Upper Hearst Project -- Question set A

###

End of Question Set A



Letter IND 145

Planning Departmental &lt;planning@berkeley.edu&gt;

## Public Comment on Upper Hearst Project -- Question set B

D Buckwald &lt;dbuckwald@hotmail.com&gt;

Fri, Apr 12, 2019 at 4:48 PM

To: "planning@berkeley.edu" &lt;planning@berkeley.edu&gt;

Doug Buckwald  
2646 Dwight Way  
Berkeley, CA 94704

April 12, 2019

### THE "MAGIC BASELINE" THEORY

Many people have argued that the dramatic 44% increase in the student population at UC Berkeley must be covered in a new Supplemental EIR with robust CEQA review. I wholeheartedly agree. Moreover, I think a full CEQA examination is required, which should include the consideration of alternatives including the "No Project" alternative (i.e. no population growth and a reduction to the 33,560 student level.

It is very unusual that the campus population increase is included in the DSEIR for Upper Hearst, because its importance far overshadows the building project and the related amendment to the housing zone. It is also apparent that the University did not operate in a transparent manner regarding this issue because it does not even appear in the title of the DSEIR. The University is a publicly-funded institution that has an obligation to be transparent in its dealings with the public. It has failed fundamentally in this current DSEIR.

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Here is a useful analogy:

Imagine you are a developer who gets a permit to construct a four-story building. Of course, you have gone through a long approval process for the project and all of the stakeholders have had an opportunity to comment and participate in any corrections, deficiencies, or mitigations involving your project.

But, instead of stopping at the approved four stories, you continue building until the structure towers ten stories high. What should be done? Most cities would require you to reconstruct the building so that it conforms to the four-story height limit. But instead, you insist that there is no problem -- because you claim that the new baseline height limit should just be increased to ten stories. Then, you act as if it's already a done deal and everybody must accept your new standard -- without any additional public process to account for the substantially-increased impacts.

This is essentially what UC has done regarding its massive increase in student enrollment. It is entirely inappropriate for its new campus enrollment total to become a baseline for anything. In a word, its cheating -- just like the corrupt builder who violates the terms of his permit.

Such a fundamental change in population certainly constitutes a project as defined by in CEQA. The student population increase will have impacts all across campus; in the blocks adjacent to campus, and throughout the city environs. The cursory and pro-forma comments made in the DSEIR do you not begin to address the issues and major impacts that are raised by this change.

**Question 1:** Which official or officials at UC Berkeley determined that these three major issues should be combined within a single DSEIR? What criteria did they use?

**Question 2:** Who decided on the wording in the title of this DSEIR that hides one of the most important issues?

**Question 3:** Who is the chief planner who has the highest authority regarding the design and content of this DSEIR?

**Question 4:** Is there any official at UC Berkeley who works to ensure that the University operates in a transparent way towards the public so that it may be held accountable for its use of taxpayer funds?

**Question 5:** Will the University agree to deal with the campus population increase issue in a way that allows all stakeholders -- including students, city residents, city officials, and university employees -- to become fully informed about it and participate in its resolution?

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**Question 6:** It appears that UC believes that it can make an exception to any component of its LRDP or other planning documents by simply stating the the change is necessary to support "excellence" at the Berkeley campus. (Please see Appendix B).

(a) Are there any guidelines or written limitations regarding what supports "excellence"?

(b) Who exactly makes the decisions about this issue?

(c) Exactly how is excellence defined for this purpose? (Please supply as specific and detailed an account as possible that will allow for reasonably-informed decision making about this quality.). As it stands now, it appears that the University can use "excellence" as its carte blanche to do anything at all it wishes to do that might contradict previously approved and community-developed planning guidelines.

###

End Question Set B

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## Public comment on Upper Hearst DSEIR

D Buckwald <dbuckwald@hotmail.com>

Fri, Apr 12, 2019 at 4:59 PM

To: "planning@berkeley.edu" <planning@berkeley.edu>

Doug Buckwald  
2646 Dwight Way  
Berkeley, CA. 95704

April 12, 2019

### BEDS DON'T SOLVE THE PROBLEMS CAUSED BY EXCESSIVE STUDENT ENROLLMENT

Some UC officials and city officials suggest that the only thing UC has to do to mitigate the increase in the student population is to provide a bed for each new student: I strongly disagree! The students who have taken over my neighborhood all have beds, but that certainly does not lessen in any way their negative impact on the quality of life in our area. In fact, it is just the opposite. The more student housing that is built here, the more unruly and uncooperative and illegal the student behavior becomes -- simply because there are more students to engage in it and they actively encourage each other to engage in wrongdoing. They have little to no concern about their neighbors' rights or the good of the community.

Another reason I oppose the construction of more student housing is that it sets an ever-increasing baseline for the enrollment numbers that UC will approve, because once these residence units are built, UC will feel it must keep them occupied to maintain its financial profits from them. They will be viewed as essential revenue sources for campus operations and services. Thus, if the maximum square feet of new student housing is built, it will be very difficult for UC to allow the overall campus population to decrease even if other social, cultural, and financial factors might naturally lead to such a contraction. We would be stuck with a swollen campus environment indefinitely, along with all of the negative impacts of crowded living conditions and uncivil behaviors that severely diminish our quality of life. As I mentioned on the phone, these negative behaviors would be magnified in the densest blocks surrounding the campus, particularly in neighborhoods like mine in the Southside.

Of course, this is why most colleges and universities in the US are expected to house the vast majority of their students within their campus boundaries. Instead, UC Berkeley outsources the negative impacts of unruly students by keeping their residences out of its core campus. This burden is left for their neighbors to bear, and it is a very unwelcome burden. More than a few times, after I ask students to keep their party noise down so people could sleep -- or to stop throwing fast food trash on the sidewalk -- they emphatically reply, "Hey, if you don't like it here, why don't you move?!" They clearly feel that the students own the Southside, and they have the right to set whatever behavior standards they wish. It is the unbridled arrogance and insensitivity of these Cal students that makes them stand out so much. It did not used to be this way; I've witnessed major changes over the last 35 years.

Here is a common occurrence these days, and it stands as a metaphor for the current Cal students: if a line of students is walking towards you four or five abreast on the sidewalk, and you try to keep walking forward to pass by on the barest sliver of an edge on the sidewalk, they will not step out of the way to let you pass -- more often than not, they will run into you, and then curse or castigate you for failing to get out of their way. They literally expect you to step into the planting strip or off the curb into the street to allow them to pass.

Inconsiderate student behavior is one thing that alters the environment, and the physical buildings erected to house all of these students is another. The new buildings constructed by UC are geared to maximize the profits they make it out of UC's real estate. They are mostly all built to heights that exceed city zoning limits, and they allow too much density per acre. They are all built out to the edge of the envelope so they displace needed green space and setbacks. They are so massive that their bulky rectangular battlements and edifices block out views of the sky and sun light, and create vast swaths of permanent shade. They block breezes that can blow away stale air and smog. They link together up and down entire streets to form endless walls of steel, concrete, and glass. These "noise corridors" magnify street noises so that even formerly quiet streets become 24-hour-a-day sound generators. And the brutal modernist architecture of these new residential structures is not intended to fit harmoniously into the character of the neighborhoods where they are built. On the contrary, they are intended to stand out, and their sharply contrasting style and oppressive bulk changes the character of the whole block and sometimes an entire neighborhood. I think that all of the descriptions above can be applied to the proposed project

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All of the above is but a small part of a big story: the myriad ways that increasing the Cal campus population steadily -- and often irreparably -- decreases the quality of life for many who live in this city. We have lost the ability to experience the quiet enjoyment of our homes and neighborhoods. We have lost the ability to control our lives.

None of these things is adequately reflected in the narrow, self-serving set of criteria that UC uses to justify its endless stream of projects in its EIRs and LRDPs. To UC's planners, no impact is so significant that it cannot be mitigated by a flimsy, meaningless procedure or action that will cost them little or nothing, and no impact is ever viewed as negative unless it directly impacts the core campus and those who work, study, and teach there.

\*\*\*

It is not enough for UC Berkeley to pay money for services to the City to mitigate all of the damages it causes throughout the city's neighborhoods through its continued population growth. As the above account makes clear, the money the city receives for water service, fire department prep protection, etc. does not impact our daily life as we deal with the multitude of problems caused by the large number of students here.

Will the University consider real mitigation that actually address the harm caused before it embarks on any other projects or approves enrollment increases from this point forward?

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Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public comment on Upper Hearst DSEIR

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**D Buckwald** <dbuckwald@hotmail.com>

Fri, Apr 12, 2019 at 5:28 PM

To: "planning@berkeley.edu" &lt;planning@berkeley.edu&gt;

I noticed that the concluding paragraphs of my final email to you today were accidentally cut off. Can you please add them to my previous email entitled **"BEDS DON'T SOLVE THE PROBLEMS CAUSED BY EXCESSIVE STUDENT ENROLLMENT"**?

\*\*\*

In its 2020 LRDP, UC asserts that it is "axiomatic" that "there should be no further degradation of the Campus Park landscape." Because of this, UC further asserts that any major development that is planned "must" be accommodated in the "adjacent blocks." UC is thus the ultimate NIMBY: "Not in our backyard, but we'll put whatever we want in yours. And you can't stop us!"

Those of us residents who are unfortunate enough to live near the campus have no choice in the matter; UC will do whatever it wants with the property it controls in our neighborhoods. This harsh reality gives the lie to UC's often repeated policy objectives: "to work cooperatively with residents" to "plan every new project to respect and enhance the character and livability of the neighborhood environment."

I know of no single resident who has ever described a university project as "respecting the character" or "enhancing the livability" of his or her neighborhood. On the contrary, nearly all residents agree that UC's development projects permanently damage both the character and livability of their neighborhoods.

For any CEQA review to be complete, these issues must be taken into account, and meaningful mitigations must be adopted that effectively address and reduce the harmful impacts that arise from UC's development projects.



April 12, 2019

Letter IND 147

Raphael Breines, Senior Planner  
University of California, Berkeley  
Physical & Environmental Planning  
University of California, Berkeley  
300 A&E Building, Berkeley, CA 94720

RE: SEIR for Upper Hearst Development

## **The Upper Hearst Project and the Increase in Enrollment Must Be Severed, rather than Considered within One SEIR**

The Upper Hearst Project has nothing to do with the extreme increase in enrollment that UC has implemented since the 2020 LRDP EIR. Yet the two programs have been illogically and inappropriately linked within this SEIR. Moreover, the enrollment increase, while leading to financial benefits for UC, has brought *massive environmental impacts to the residents of the city of Berkeley*.

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The SEIR consistently reads as though the only possible impacts of the enrollment increase would occur on the campus, and that since there are no impacts on campus, nothing is worthy of analysis.

Of course UC's pristine "green" campus doesn't suffer from impacts, as the SEIR repeatedly states, because the additional students do not reside on the pristine, protected campus. They reside in neighborhoods in proximity to the campus. Therefore the residents and taxpayers of Berkeley receive the adverse environmental impacts. The SEIR denies the need to analyze and mitigate the impacts to Berkeley residents of the increased enrollment by simply ignoring all impacts that occur off-campus. CEQA requires the analysis of impacts to consider the 'affected environment' which includes the area around the UC Berkeley Campus.

IND  
147.2

## **Proliferation of mini-dorms in the impacted neighborhoods**

Over the years since the 2020 LRDP EIR, enrollment has increased so much that nearly all housing within a mile of the campus is now regarded by investors as a potential profit source. At some point I began to notice that houses for sale in my neighborhood were being marketed and sold, not as homes, but as investments to be filled with as many students as possible. These investments are called mini-dorms.

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The mini-dorm phenomenon developed and flourished due to UC's huge increase in students for its own financial gain. This has led to noise, traffic, a proliferation of garbage on sidewalks and streets during periods when students are moving in and out (see Exhibit A), and loss of public services for other Berkeley residents at times when alcohol-fueled parties are prevalent.

In my immediate neighborhood, a duplex that had been family-owned and occupied for many decades was for sale late in 2014. Because I attended the realtor's open house, I learned first-hand how Berkeley property is viewed by investors as a result of the over-enrollment (see Exhibit B). In that case, investors had actually moved here from Washington State to cash in on the Berkeley student rental boom. The duplex was purchased by a different investor and grossly expanded to contain a plethora of bedrooms, causing problems for neighbors. This is just one example of many conversions of housing

to highly dense student housing, with densities often exceeding the Zoning Code by factors of 3 to 4.

Mini-dorms within neighborhoods generate major adverse impacts with respect to noise, population, public services, transportation and traffic. In addition to the specific impacts mentioned above, mini-dorms frequently generate extreme party noise, often into the wee hours of the morning. Because there has been no increase in police officers in Berkeley, calling the police when one is kept awake by party noise is often useless, as they are too busy to go to each screaming party.

IND  
147.3

Traffic impacts are severe. Even if few of the mini-dorm residents own automobiles of their own, traffic and noise is generated by every Uber and Lyft ride undertaken, by every Amazon, FedEx, USPS and UPS truck delivery, and all the food deliveries that occur each day and evening. Just a few days ago, a vehicle for a business previously unknown to me double-parked right in front of me. It's called Rinse.com. According to their website, this business picks up, cleans and delivers laundry "to your door." This traffic might be worse than that caused by resident-owned cars, because the vehicles rendering a service generally need to double-park on our neighborhood streets, potentially introducing new roadway hazards.

### **Displacement of the most vulnerable residents of our neighborhoods**

Berkeley's new reputation among investors as a place where every bedroom equals a goldmine, a direct product of UC's policy of ever-increasing enrollment, has led to a loss of other needed, but less remunerative uses of property. I am aware of four South Berkeley residential care facilities that have closed within a couple of years. Two that had been board and care facilities are now mini-dorms or rooming houses. One nursing home on Shattuck Avenue is scheduled for demolition, to be replaced by a six-story apartment building. The growth in student population is frequently cited as why there is a limitless need for six-story buildings, which bring their own detrimental impacts.

IND  
147.4

The former board and care facility I am most familiar with is located in my immediate neighborhood, at 2555 Fulton Street. It was occupied by 15 men with mental disabilities. They were good neighbors; some had lived there for decades. It was their home. Over the years, several residents told me that this facility was considered one of the best of its kind in the area.

Approximately two years ago, the building was sold. I then learned from a resident that they were being evicted with only 60 days notice and without "just cause for eviction" (which would have been required of any other rental property in Berkeley.)

The 2555 Fulton facility was closed and the residents were evicted in order to convert this building into a mini-dorm, as the purchasers of the building stated in their application to the City of Berkeley to convert it (see Exhibit C). In their applicant statement, they claim a need for mini-dorm housing due to the "severe shortage of student housing." Although the statement says that the former facility operator was retiring, in fact, she continues to operate at least one other care facility in a nearby city.

When this change of use was approved by the Zoning Adjustments Board on December 13, 2018, a neighbor testified ". . .when I moved to the neighborhood, there were six or seven residential care facilities within it. Now I think there are two. And Berkeley talks a lot

about its vulnerable populations, particularly those who live on the street. But there's another vulnerable population, people who are housed, but need to be housed in circumstances where they get care . . . so these places are disappearing from Berkeley, now, as they become more valuable for other housing uses." At the approval hearing, one of the applicants again referred to the housing shortage *for students*. Clearly UC's vast increase in enrollment has impacted these Berkeley residents in the worst possible way, by displacing them from their homes.

↑  
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### **What's the real function of the enrollment increase?**

The SEIR says on page 44, "The increase in student enrollment results primarily from implementation of the California Master Plan for Higher Education." It says on page 133, "Increasing headcount projections to accommodate additional students would also be consistent with UC Berkeley's responsibility under the Master Plan for Higher Education to increase its capacity commensurate with growth of the college-age population in California." The Master Plan was about providing an education to *California* students.

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Apparently something other than the Master Plan was the guiding force in UC's decisions about increasing enrollment. UC was audited in 2015 by the California State Auditor. The Auditor's Report, titled: "The University of California, Its Admission and Financial Decisions Have Disadvantaged California Resident Students," came out in March 2016.

The Summary of this report says on page 1 that in academic year 2014-15, nonresident tuition and fees were \$37,000, while resident tuition and fees were \$12,240. Quite a difference! The Summary further states that for academic years 2010-11 through 2014-15, total nonresident enrollment at the university increased by 82 percent, while resident enrollment decreased by 1 percent. Table 15 on page 69 of the audit shows figures for Berkeley. For the same time period, nonresident enrollment at Berkeley increased by 3,914 students, while resident enrollment *decreased* by 2,453.

The audit did not anticipate a rapid improvement in enrollment of resident students. On page 44, it says, ". . . the university has acknowledged that it intends to continue to admit increasing numbers of nonresidents, and in its 2016-17 operating budget, the university indicated that nonresident revenue continues to be a key part of its financial plan. Thus, until the university's financial incentive to enroll nonresidents is mitigated, it will likely continue to admit increasing numbers of nonresidents."

A Discussion Item for the July 18, 2018 meeting of the Academic and Student Affairs Committee shows, in Figure 1 on page 2, the percentage of nonresident undergraduates at the various UC campuses in Fall 2017. It shows UC Berkeley at 24.6 percent nonresident undergrads, the highest percentage of all the campuses (see Exhibit D). The text explains that nonresident enrollment will be capped at 18 percent for five of the campuses, but the remaining four campuses, which include Berkeley, will be capped at the proportion the campus enrolled in 2017-18.

The Master Plan for Higher Education can hardly be used to justify the decision to vastly increase enrollment at Berkeley.

### **Population and Housing, errors and assumptions**

The section of the SEIR on population and housing, beginning on page 149, seems to be packed with erroneous assumptions but, in keeping with the rest of the SEIR's discussion of the enrollment increase, devoid of analysis or study.

According to this section, the 2020 LRDP EIR analyzed the effect of increased campus headcount based upon an expected increase in employees as well as students. However, UC has decreased its number of employees, while increasing the number of students vastly. With respect to impact upon residents of an area, student population is not identical to employee population. For example, I have never, ever been awakened at 2:00 a.m. by a party conducted by UC employees. This section also states that new housing needed for population growth would be in downtown and on arterials — but mini-dorms are right smack in the neighborhoods!

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147.6

This section suggests that the population increase should be compared with the regional population of the entire bay area, rather than with the local population. Obviously, the residents within a mile of the campus are impacted by the increase in UC Berkeley enrollment, while the residents of Orinda (Emeryville, Hayward, Brisbane, etc.) are not.

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Finally, it suggests that incrementally greater noise from "social gatherings," would not be a significant impact. Yet, the variety of screaming parties that have become the norm during the mini-dorm era were rare to nonexistent prior to the certification of the 2020 LRDP EIR. The real impacts of the real circumstances for Berkeley residents within a mile of the campus are desperately in need of analysis and mitigation.

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#### QUESTIONS:

1. What provision in CEQA entitles UC to combine in one SEIR two unrelated matters, a physical project (Hearst) and an entirely unanalyzed increase in enrollment that has *already occurred*?

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2. Is UC defining its implementation of an increase in enrollment as a project in the SEIR?

3. Explain how analyzing the impacts of increased enrollment *on the campus* could suffice for analyzing the impacts to those residents of Berkeley who do not reside on campus.

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At the top of page 2, the SEIR says "The California Environmental Quality Act (CEQA) requires lead agencies to disclose and consider the environmental consequences of **proposed** discretionary projects **prior** to taking approval action on such projects" (emphasis added).

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4. How does the increase in enrollment that has already occurred qualify as *proposed*?

5. How does the increase in enrollment that has already occurred qualify as something that has been disclosed and considered *prior* to taking approval action on?

6. How do you explain inserting an activity that has already occurred and already created adverse impacts into an SEIR for a proposed development project that is seeking approval?

On page 3, the SEIR says "Despite the growth in campus headcount over 2020 LRDP projections, which led to the new baseline, the analysis in this SEIR demonstrates that the UC Berkeley campus is still operating within the capacity and demand identified and

IND  
147.12

analyzed in the 2020 LRDP EIR . . ."

7. How did the "growth in campus headcount," essentially a violation of the LRDP, magically "[lead] to the new baseline"?

On page 3, the SEIR says that in a response to comments to the 2020 LRDP, UC made a commitment to the City of Berkeley that: "if enrollment increased beyond the projections set forth in the 2020 LRDP, it would undertake additional review under CEQA."

8. Where's the promised additional review?

The SEIR says on page 44, "The increase in student enrollment results primarily from implementation of the California Master Plan for Higher Education."

9. Explain this in light of the fact that resident enrollment (students from California) has decreased, while nonresident enrollment has increased in recent years.

A Berkeleyside article quoted "unnamed UC officials" saying that "CEQA law requires the university to include the bumped-up enrollment figures in its examination of the Upper Hearst project."

10. If the UC officials were quoted correctly by the author of the article, what provision of CEQA law requires the university to include the increased enrollment figures in its examination of the Upper Hearst Project, while doing no analysis whatsoever of the many impacts of the enrollment increase that have nothing to do with the Upper Hearst Project?

Sincerely

Gale Garcia



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147.13

IND  
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147.15



Exhibit A,  
Photos of move-out day, 2014 and  
2015 in Le Conte Neighborhood





received from Planning indicated that it needed no Traffic Engineering approval, because the project was not a new building, “but some form of remodel.”

The Council meeting of January 13 was very disturbing. Some of the Councilmembers who had been deeply opposed to mini-dorms as recently as late 2013 were falling over themselves to compliment Mr. George, as though the historic beauty of the Bartletts was all his doing, and as though the concept of mini-dorms was a distant memory. Some spoke of a “compromise” to allow Mr. George only 13 or 15 additional bedrooms by removing a few doors and bits of wall from his project plans. Do they seriously believe that a 5% smaller mini-dorm extravaganza would solve the neighborhood devastation caused by overstuffed student rentals?

Some statements from Council members were rather stunning, and sounded like the content may have come directly from Rhoades’ lobbying efforts.

Ms. Maio said regarding the site, “to me, it’s not mini-dorms.” Well, currently it’s 22 bedrooms occupied almost entirely by students, with a resident sports team engaged in frequent late-night shouting binges – and it’s not a mini-dorm? I’d have to wonder what Ms. Maio would consider to be a mini-dorm. Would it have to have 30 bedrooms occupied by 60 students and at least 1.5 sports teams screaming into the night?

Ms. Wengraf stated, “I think that the mini-dorm ordinance, although very well intentioned ... has had pretty serious unintended consequences.” Well, this is only the second project to have been denied due to the mini-dorm ordinance, and the first appeal to be heard (the other denial was also appealed), yet Ms. Wengraf sees unintended consequences? So far there haven’t been *any* consequences!

Then the matter of the illegal 130-foot driveway arose. Further amazing statements were delivered.

When Mr. Capitelli asked whether the driveway had been reviewed by the Traffic Engineer, Planning Director Eric Angstadt answered, “No ... that comes with the building permits when the final requirements for all of those things are looked at.” Planner Claudine Asbagh said, “Planning in general will forward these applications through to get a run-through by the departments to make sure what’s being proposed isn’t absolutely preposterous.” (When? After the Use Permit has been approved and the applicant is allowed to build the project no matter what?)

So what has happened here? I would wager that this driveway is the most preposterous ever to seek approval in the City of Berkeley. Yet, apparently, my numerous requests that it be examined by the Traffic Engineer were ignored. When I described its dimensions to a friend who is a project manager, he said simply, “that is *not* a viable driveway.”

The City Council delayed their decision on this

matter until February 17. If the Council approves a Use Permit for this project with the grossly illegal driveway, knowing that it can neither be made conforming, *nor safe*, something is terribly wrong with the procedures of the Planning Department. Despite my repeated attempts to inform Planning staff that the driveway had unsolvable safety problems, they deemed the project ready for prime time. Is it possible that the involvement of former Planning Manager Rhoades with the project had something to do with their deeply flawed decisions? ■

## Investors Flocking to Berkeley, where every Bedroom is a Goldmine

—by Gale Garcia

In early November, a friend and I attended a realtor’s open house for a large Victorian duplex on an oversized lot in the LeConte Neighborhood. The property, definitely in fixer-upper condition, was offered at \$989,000.

A young man who attended the event seemed to think that we, also, were eyeing the property as investors. He was eager to chat. He revealed that he was there



2239 Blake, another glorious Victorian on Blake Street in the historic LeConte Neighborhood

to assess the property as a potential investment for his employers, who had relocated from Washington State about a year ago to pursue investment properties *here*. He stated with confidence that each bedroom in Berkeley would fetch at least \$1,000 per month in rent.

So investors from other states are coming here to cash in on the Berkeley rental market, where every bedroom is a goldmine.

I heard from an immediate neighbor that there were more than 20 offers for the property. The sale closed on December 29th and the sales price was reportedly well over a \$1 million. Neighbors are concerned. ■

RECEIVED

DEC 15 2017

LAND USE PLANNING

Dear Zoning Board Members,

We are applying for a dwelling unit use permit for our newly purchased property: 2555 Fulton St.

This property has been used as a care center for mentally disable people. However, the previous owner Annie Jacob has retired and has decided to close down the care center, and all the patients have found placement by the Alameda County. After consulting with the Berkeley planning department and in line with the need of the city (caused by the severe shortage of student housing), we intend to use the property as a student mini-dorm. The ordinance No. 7455-NS allows the usage of R-2A zoning houses (which our property belongs) to be used as student mini-dorms. Due to the usage change, according to the Berkeley zoning department, the most proper permit will be a residential dwelling unit permit. We are thus applying for such a permit.

As you might have noticed, the internal layout of the property might not look like a typical family house, although there is no strict requirement for what a single dwelling unit should look like. Nevertheless this layout should be perfect for a student mini-dorm. According to the definition of Household as One or more persons, whether or not related by blood, sharing a dwelling unit in a living arrangement usually characterized by sharing living expenses, as well as maintaining a single lease or rental agreement for all members of the Household. In this legal sense, the dwelling unit definition is irrelevant to the look of the properties' layout. As stated above, the application for a single dwelling unit is carefully thought after many discussions with zoning office and reviewing our property layout. There is no other specific permit for student mini-dorms, while student mini-dorm is encouraged by the city government to solve the student housing shortage.

We are well aware of potential concerns by some of the neighbors for possible disturbance a student mini-dorm might cause. We have studied the ordinance No. 7455-NS carefully. We believe our student mini-dorm should no impact for the neighborhood if not less than its previous usage as a mentally disable care facility. The neighborhood is already filled with many students from UCB, and one of the immediate neighboring building is an apartment building hosting UCB students. The room sizes in our property satisfy the requirements listed in ordinance No. 7455-NS, and adequate shared bath rooms are provided. We plan to have an onsite manager to deal with issues like garbage collection, noise control and outside lawn maintenance to be in line with city requirement to enforce large party and consumption of alcohol are prohibited. There are two parking spots within the property. Only about 10 minutes' walk from UCB, and with a shared public bicycle stand across the street, we expect most of the students will not bring in a car. We have every intention to make it a quiet and neighborhood friendly place.

We have worked in Berkeley for the past more than a decade. As a long time Berkeley resident, we believe in quiet, friendly and equal opportunity neighborhood. We would appreciate your support to establish a dwelling unit by converting from a community care facility of 2555 Fulton St.

Sincerely Yours



**A4**

**Office of the President**

**TO THE MEMBERS OF THE ACADEMIC AND STUDENT AFFAIRS COMMITTEE:**

**DISCUSSION ITEM**

***For Meeting July 18, 2018***

**NONRESIDENT UNDERGRADUATES AND THEIR UNIVERSITY OF CALIFORNIA  
EXPERIENCE**

**EXECUTIVE SUMMARY**

In prior discussions of nonresident undergraduate students and the policies that pertain to them, the Regents have affirmed (1) that enrollment of nonresident undergraduate students should not displace California resident students but instead be over and above the enrollment of State-funded California undergraduates, and (2) the importance of having nonresident undergraduate students at the University of California. Regents Policy 2109: Policy on Nonresident Student Enrollment states that “the University values highly the diversity of experience, cultures, and backgrounds that nonresidents provide and sees their presence on every UC campus as an important part of the learning experience for California students.” California’s social, cultural, and economic development is increasingly dependent on interactions with societies and cultures beyond its borders. Geographic diversity enhances the teaching and learning experience and contributes to the University’s academic quality and excellence. All students are better prepared to live in and work effectively in an increasingly global world through interactions with students from other states and nations.

Nonresident students, specifically non-California domestic and international undergraduates, represent just over 17 percent of UC’s undergraduate population. Through fall 2008, nonresidents represented approximately five percent of the undergraduate student body, but their share has grown, though their proportion is still much lower than at comparable public research universities.

This item provides the Regents background information about nonresident undergraduates, along with policies and programs that affect their educational experience.

**BACKGROUND**

***Nonresident Enrollment***

Over the past decade, the nonresident share of undergraduate fall enrollment, defined as those paying nonresident tuition, has grown from 5.2 percent in fall 2008 to 17.2 percent in fall 2017, percentages which are still well below UC’s Association of American University (AAU) public

**ACADEMIC AND STUDENT  
AFFAIRS COMMITTEE**  
**July 18, 2018**

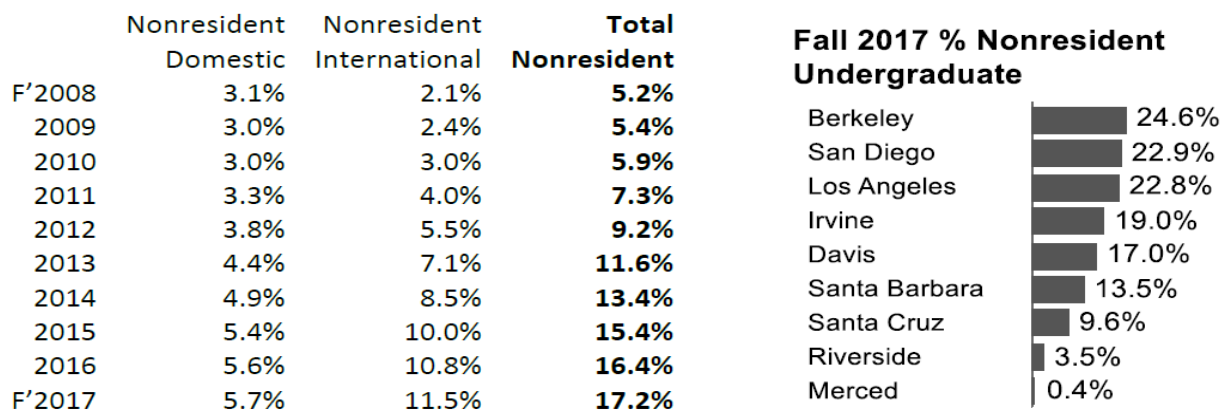
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A4

peers. In fall 2016, 16.5 percent of UC undergraduates were nonresident, compared to 28.7 percent at AAU non-UC public institutions.

In May 2017, the UC Board of Regents approved a policy that affirmed that nonresident undergraduates “will continue to be enrolled in addition to, rather than in place of, funded California undergraduates at each campus.” The Board also capped nonresident enrollment at 18 percent for five UC campuses (Davis, Merced, Riverside, Santa Barbara and Santa Cruz) and capped nonresident enrollment for the remaining four campuses (Berkeley, Irvine, Los Angeles, and San Diego) at the proportion each campus enrolled in 2017-18. The relevant campus percentages for fall 2017 are presented in Figure 1.

**Figure 1: Proportion of Nonresident Domestic and International Undergraduates**



Source: UC Information Center

Texas, Washington, New York, and New Jersey are the top states for UC's domestic nonresidents, each representing approximately six percent of that population; whereas two-thirds of UC's international students come from China.

**Table 1: State and Country of Origin for Nonresident Undergraduates**

**Top 10 States for  
Domestic Nonresidents**

|               |      |     |
|---------------|------|-----|
| Texas         | 6.2% | 769 |
| Washington    | 6.0% | 742 |
| New York      | 5.9% | 730 |
| New Jersey    | 5.8% | 711 |
| Illinois      | 4.8% | 586 |
| Florida       | 4.1% | 501 |
| Arizona       | 3.4% | 424 |
| Massachusetts | 3.4% | 421 |
| Colorado      | 3.1% | 378 |
| Virginia      | 2.9% | 352 |

**Top 10 Countries of Citizenship for  
International Nonresidents**

|                |       |        |
|----------------|-------|--------|
| China          | 66.9% | 16,624 |
| South Korea    | 6.5%  | 1,623  |
| India          | 5.1%  | 1,268  |
| Taiwan         | 2.7%  | 676    |
| Indonesia      | 2.1%  | 518    |
| Canada         | 1.8%  | 445    |
| Japan          | 1.3%  | 335    |
| Malaysia       | 1.2%  | 289    |
| Vietnam        | 0.9%  | 218    |
| United Kingdom | 0.8%  | 204    |

Source: Fall Enrollment file and UC Information Center

## Public comments: Upper Hearst Development Project

Gladys BLOCK <gblock@berkeley.edu>

Fri, Apr 12, 2019 at 3:04 PM

To: planning@berkeley.edu

Cc: gladys block <gblock@berkeley.edu>, Cliff Block <cliffbus@aol.com>, Daniella Thompson <dt@daniellathompson.com>

I write as a current neighbor of the proposed project, and as a UC Berkeley Emerita faculty member.

1. The proposed project is grotesquely inappropriate for the neighborhood. It is far too massive, and the design is in violent contrast with the small-scale, classic brown-shingle or Maybeck, historic neighborhood.

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2. The proposed project will have serious deleterious impacts on parking and safety in the neighborhood. The neighborhood has mainly street parking, with few residents having driveways. The proposed project will remove the current parking facility of 345 spaces, and replace it with parking -- other than for residents of the new building -- for only 80 non-residents of the new building. Presumably the other 265 people who used to park in the current parking facility will have to seek parking in our (formerly quiet) neighborhood. Street parking in the neighborhood is already a problem for residents, and this project will only exacerbate the problem and increase the danger to residents and students living in the neighborhood.

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148.2

If this project is destined to proceed regardless of the protests from residents of the neighborhood, we urge you to limit the project to the **Reduced Scale Alternative**, and **change the design** to be appropriate for the scale and characteristics of this historic neighborhood.

IND  
148.3

Gladys Block

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Gladys Block, Ph.D., Professor Emerita, University of California, Berkeley. <http://sph.berkeley.edu/faculty/block.php>

Scientific Director, Turnaround Health (<http://www.turnaroundhealth.com>) and NutritionQuest. <http://www.nutritionquest.com>

510-301-2984

Our diabetes prevention online program: Randomized trial results: 1: Significant effects on HbA1c, glucose, weight: <http://escholarship.org/uc/item/07705820>. 2: Significant effects on exercise, eating, quality of life: <http://www.nature.com/nutd/journal/v6/n9/full/nutd201642a.html>. More info: <http://www.turnaroundhealth.com>.

"Predicting rain doesn't count. Building arks does." Warren Buffet

"I keep thinking that I shall have no more to say, and then finding some wonderfully idiotic doctrine which I can contradict."  
Mary Midgley, philosopher, at age 82. (NYT 10/18/18)

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**Public Comments: Upper Hearst Development Project**

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**Imke DE PATER** <imke@berkeley.edu>  
To: planning@berkeley.edu

Fri, Apr 12, 2019 at 9:54 PM

I am extremely concerned about the demolition of the Upper Hearst Parking lot, a premier parking lot for everyone on the N. side of the campus. We pay \$151.-/month for parking. A loss of 300 parking spaces, without a new structure nearby before demolition starts, is unacceptable, in my mind. I do not understand why **new academic space for the Goldman School of Public Policy and new housing for faculty takes preference over making sure faculty, staff and researchers can actually come to campus to do their job.**

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149.1

I sincerely hope you will abandon this idea, at least until you have secured additional parking on the N. side of Campus. An acceptable alternative might perhaps be the parking under the stadium, which presumably could easily be changed into a campus parking lot. I do not know, though, how many spaces this lot holds.

Sincerely,

Imke de Pater

=====  
Imke de Pater                      phone: 510-642-5275 (general number)

Professor of Astronomy              fax: 510-642-3411  
Professor of Earth and Planetary Science  
501 Campbell Hall                  Email: [imke@berkeley.edu](mailto:imke@berkeley.edu)  
University of California  
Berkeley CA 94720

<http://astro.berkeley.edu/~imke>

=====

# Comments on the Draft Supplemental EIR to the 2020 Long Range Development Plan Environmental Impact Report of the University of California, Berkeley

Isis Feral  
April 12, 2019

The Draft SEIR for the Upper Hearst Development for the Goldman School of Public Policy is more than a supplement or minor amendment to the 2020 LRDP EIR, but substantially alters the original plan. The increase in the university population cannot be downplayed as negligible, but violates prior agreements with the City of Berkeley, and would have a major impact on long-term residents of the city and surrounding towns.

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The project itself would cause massive construction pollution in the residential neighborhood where the site is located, including toxic dust, and noise from idling trucks and other equipment. After months of disturbing residents from the peaceful enjoyment of their homes, the final result would be an ugly monster of a building that would drastically alter the character of the neighborhood. It would also install a number of LED lights, including some motion activated, that would increase light pollution, and impact people with disabilities who are prone to seizures and other neurological effects from light flicker and dirty electricity that are common in LED bulbs.

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As the university population has been increasing, long-term Berkeley residents are being displaced, with many ending up in the streets. Increasingly even UC students are becoming homeless, not properly supported by an overpriced, overcrowded public university, and then chased out of town by abusive city policies against parking the vehicles they live in at public sidewalks. The housing proposed in the SEIR is not for those unhoused students who are already here, or to leave room for the locals. It's not an effort to find a solution for the already existing housing problem, but to expand the university and bring in more students, further compounding these problems.

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I oppose the expansion and constant growth of UC Berkeley, its long history of grabbing city land, and taking over ever more of the towns surrounding it. This causes not just a burden on housing and other infrastructure, but with the temporary nature of the ever changing university population, city policy is also influenced when students get involved in local politics, then move back out of the area after they finish their limited few years of school, and leave long-term residents with the fallout of the decisions they influenced. We've seen this particularly with the student newspaper, for example when the Daily Cal has made election recommendations, and its editorial staff played gatekeeper to prevent rebuttals from locals who understood the issues from decades of living here better than they did.

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But most worrisome in the SEIR are the frequent references to "future" projects elsewhere, which we have long been warned would include People's Park, a vital public commons where the community gathers for events, where displaced people who lack housing and who struggle for survival can take a much needed rest in the shade of the trees, where activists share food and resources, and are tending the soil and growing a garden.

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150.5

The destruction of this historic landmark already started a few months ago, without warning, with the deforestation of dozens of trees, which changed the character and climate of the park, which now lacks

the extensive forested area of cooling shade that was there before. The university's early morning assault on the park was reminiscent of the rush to illegally clearcut Frowning Ridge before FEMA's East Bay Hills Environmental Impact Statement, which was reviewing the impacts of removing trees from that site, along with plans by UC, the East Bay Regional Park District, and the City of Oakland to remove close to half a million trees on thousands of acres connected to it. UC effectively denied the public a say in the matter, and destroyed the Frowning Ridge ecology.

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This SEIR process of trying to sneak in increased population numbers that violate previous agreements with the city, and claiming such increase would have no impact on our community, is also reminiscent of when UC tried to sneak in the plan to clearcut the Hills Campus area, one of the projects reviewed by FEMA that was stopped by a lawsuit by hills residents, as a mere addendum to the 2020 LRDP EIR. The addendum was also stopped by a lawsuit that challenged the university's compliance with CEQA. Looking over UC's plans outlined in the 2020 LRDP EIR and the SEIR, it's fairly obvious that the application to use FEMA grants for these clearcuts was an attempt to appropriate public emergency funds intended for fire hazard mitigation, to pay for the university's development schemes.

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UC has repeatedly shown that it does not let environmental laws get in the way of plans to expand its development and profits, and is especially determined to kill every tree in its path. Back in 2005 the university even partnered with the City of Oakland in violating the city's pesticide restrictions, when it felled trees on behalf of the city, and illegally applied toxic chemicals to the remaining stumps. The project described in the SEIR alone would kill 70 more trees.

I oppose any increase in the university population, as well as any further development by UC Berkeley across the city, especially any further felling of trees. I particularly oppose the development of People's Park, and warn policy makers that such attempts would almost certainly be met with resistance from the community, as all such previous attempts over the last 50 years have. Those who died and were injured by violent police actions against the community that defended the park as our public commons, would not be properly honored by symbolic memorials, but require that People's Park once and for all be declared a protected historical landmark that belongs to the community, not the university.

IND  
150.7



Letter IND 151

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Public Comments: Upper Hearst Development Project

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**Jason Simon** <jasonsimon@berkeley.edu>  
To: planning@berkeley.edu

Fri, Apr 12, 2019 at 2:44 PM

I find the lack of details regarding housing to be very problematic.

Who will control the access to the proposed rental residential units? Will priority be given to people associated with the GSPP over the campus as a whole?

What is the planned rental rate relative to market value?

Where will the profits made from this public/private partnership for management go?

Why does the university need a private partner at all to build or manage housing that is considered mission-crucial to the campus?

How was the decision made to prioritize low-density (i.e. one-bedroom, studio) units for faculty and post-graduate non-students, rather than affordable, high-density housing for either undergraduate or graduate students?

How was the residential plan developed? Was UC Berkeley Housing involved in the planning of the proposed residential project? If not, were they, or anyone else from the university in general, asked to provide input to the housing needs of the campus? If not, why were they not consulted?

Are there limitations to the site that make even more housing units impossible?

Is the expansion to the GSPP considered more crucial than developing only housing?

More generally, how was the GSPP given development rights to this site? Was the College of Engineering offered potential rights to develop the site? Is the GSPP considered more needing of expanded space than COE?

-Jason Simon

IND  
151.1

J M SHARP POB 4756 BERKELEY CA 94704 510-848-6897

12 April 2019

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
University of California, Berkeley  
300 A&E Building  
Berkeley CA 94720-1382

*Received April 12, 2019  
- Raphael Breines*

**Re: Comments on the Draft Supplemental Environmental Impact Report (DSEIR) for the Goldman School of Public Policy (GSPP) Upper Hearst Development project and Minor Amendment to the 2020 Long Range Development Plan (LRDP)**

Dear Mr Breines:

Welcome to another chapter in Berkeley's **GOWN SWALLOWS TOWN** saga. My comments below address the Proposed Project's deficiencies with two-dozen narrative "nuggets." Most of my questions are tossed into a "caboose" at the end.

Though the Upper Hearst Development is exceedingly complicated, I think it can be reduced to a relatively simple formula:

**DVP > P3 > ASM > \$**

where: DVP = dean's vanity project  
P3 = public private\* partnership  
ASM = aerial strip mine

\* with outsource partners ACC and CHF

My recommendations to the authors of the CEQA draft document are also uncomplicated:

First, **SCRAP** the Minor LRDP Amendment concerning density in the Campus Environs Housing Zone. The changes advocated in Appendix B (DSEIR, p 251) rest on the flimsiest of assertions concerning "an exception" needed in support of university "excellence."

Second, **SEVER** the updated population baseline discussion from the DSEIR. The relationship of existing campus headcount with 2020 LRDP projections is sufficiently important to merit its own independent CEQA document. The City of Berkeley agrees.

Third, if there's still sufficient resolve among project backers to move forward, **REDRAFT and RECIRCULATE** that part of the DSEIR that relates to the Upper Hearst Development. There's much that can be improved both within the DSEIR itself and the public process surrounding it.

IND 152.1



### **1. Trouble at the railroad yard**

We first suspected something was amiss last December when Cal's Finals Week came and went without an announcement. Where was the Goldman project's draft EIR? Normally these things are as predictable as curbside dog waste. For years, we've watched how environmental pufferbellies routinely exit UC Berkeley's CEQA railroad just before holidays. Review and response time can be kept to a minimum this way. "What's going on?" we wondered. Then came January. Then Groundhog Day. Still nothing.

### **2. Scoping flashback**

Back in March 2018 everything seemed to be on a fast track. One year to the day after UCB's Office of the Vice Chancellor Real Estate and the Goldman School of Public Policy jointly issued a Request for Qualifications (RFQ), GSPP Dean Henry Brady hosted the obligatory CEQA scoping session in the bowels of Beta Theta Pi. Pens and comment cards were offered to the handful of neighbors who bothered to appear. What began as a schmooze-fest with project partisans amid poster boards soon morphed into a military-style debriefing with slideshow. The dean and his team members spoke. We stood and listened. No time for questions, except via the cards. No refreshments were offered, except tea in the adjacent room.

### **3. Nacht, Nacht, who's there?**

For us, it was déjà vu all over again, except less comfortable and more downscale. A mere nineteen years earlier, in the same venerable building, we enjoyed the hospitality of Dean Michael Nacht. We listened to dean and team extol the virtues of a proposed annex. It was to occupy the small parking lot immediately west of Beta Theta Pi. A generous grant (north of \$20m) from the Goldman Foundation would secure the project (and school's name change). Refreshments were plentiful and delicious.

### **4. Vanity project in perspective**

It's instructive to juxtapose the two construction initiatives by the two Goldman School deans. The first, the Goldman Annex building, essentially doubled the school's usable space—from 7,500 sq ft to around 15k sq ft. Lost in the process were 22 parking spaces and several mature live oaks on Le Roy Avenue. Dean Brady's expansion plan, by contrast, will triple GSPP's current size (which now includes 4,500 sq ft of rented space at Memorial Stadium) to around 60k! Moreover, the current incarnation of the school's expansion plans permanently removes around 200 spaces from the adjacent Upper Hearst Parking Structure and lot (UPHS & UPHL). The Campus Landscape Architect has already condemned the two large coast redwoods on La Loma Avenue as non-specimen trees.

## **5. DSEIR hairball coughed up, finally**

One can hardly say it was worth the wait. The Draft Supplemental Environmental Impact Report (DSEIR) surfaced on February 20<sup>th</sup>, eleven and 23 months after the scoping session and RFQ, respectively. The document embeds the dean's dream into a nightmare matrix of disappeared parking for UPHS/L patrons and housing pie-in-the-sky for UCB's development partners. Further clouding its nearly 800 pages is a tenuous (Frankenstein-esque?) linkage to UCB's 2020 Long Range Development Plan (LRDP).

## **6. Rube Goldberg would be proud**

Why complicate unnecessarily an already thoroughly tangled environmental document? One likely possibility: it's part of the defendant's legal strategy in *Save Berkeley's Neighborhoods v. The Regents of the University of California*, Alameda County Superior Court Case No. RG18902751. In his Scoping Comments response last September (DSEIR, pp 220-222) to the mid-August Notice of Preparation (NOP), attorney Tom Lippe argues that key "structural" problems are created by combining two distinct CEQA projects in the same EIR.

## **7. Want your scrambled eggs yoked or un-yoked?**

Chief among the plaintiff's issues is UCB's burgeoning student enrollment and unmitigated impacts. Current headcounts have grown increasingly out-of-synch with baselines in the 14-year-old LRDP. Enrollment increases are a "CEQA project" in their own right, Lippe maintains, and "should not be yoked to the EIR for a major capital project that may face unknown and potentially protracted delays." University lawyers no doubt hope that certification of the Goldman SEIR by UC Regents will moot the pesky Save Berkeley's Neighborhoods case.

## **8. An exceptional edifice of excellence**

Another complication is that the revenue-generating end of the project site was previously designated by UCB for merely medium-density development. Not a problem. Fix it with a "minor amendment" to the 2020 LRDP and goose it up to "high density." The reader is reassured in Appendix B (DSEIR, p 251) that this adjustment is a "rare exception" in support of the university's continuing quest for excellence. LRDP boilerplate for the new Cal Aquatics Center on Bancroft Avenue is cited as precedent. All this can be found in section 3.1.14 City Environs Framework of the 2020 LRDP. Subhead: "Plan every new project to respect and enhance the character, livability, and cultural vitality of our city environs."

## 9. Geotechnical backfill

The more-density-in-support-of-excellence argument is buttressed by a substantial geotechnical section (Appendix D) comprising over 43 percent of the 776-page DSEIR. Is this because the proposed residential complex would sit precariously on the western edge of the Alquist-Priolo Special Study Zone? The appendix is adorned with colorful geologic maps and cross-sections of borings (drilled in mid-September 2017). Among the fascinating details revealed is that UCB's geologist in 1970 observed that "a well-developed fault trace intersects the northeast corner of parking structure." Not really a problem, conclude the authors, in their "desk study." "Oh, to be a UC 'non-fault' contractor!" exclaimed a geologist neighbor of ours.

IND 152.2

## 10. Digging to China

Execution of the ambitious Goldman project will necessitate ambitious excavation. How much? Here is what the DSEIR (p 41) says about grading:

Grading would involve an estimated 13,147 cubic yards of cut and 140 cubic yards of fill, resulting in a net export of 13,007 cubic yards of material for offsite disposal. In addition, demolition of the existing parking areas would require the export of approximately 7,000 cubic yards of material from the Project site. The maximum depth of excavation would be approximately 23 feet below grade level.

## 11. Mighty Stanley as a metric

Place yourself next to La Loma Avenue at the southeast corner of Goldman's one-acre-sized opportunity site. Cross Hearst Avenue and proceed south along Gayley Road for just 0.2km (a distance that corresponds to the approximate distance between the Hayward Fault (DSEIR, p 251) and the Goldman site. Now look to your right. There you'll find the massive Stanley Biosciences and Bioengineering Facility. Eleven stories tall (with three below grade) this structure replaced the Old Stanley Hall, which was demolished in 2005. Within its 285k-sq-ft interior, Stanley contains a three auditoriums (with a total of 465 seats) and a multimedia classroom (with 45 more). It was completed in 2007 on a budget of \$162.3m.

## 12. Tiny Goldman plays catch-up

GSPP's new 40k-sq-ft academic building will consist of office, classroom, and event space. We are told that the latter, with a seating capacity of 300, will accommodate up to 450 visitors at maximum capacity. So, Goldman with 450 (not all seated) vs Stanley with a just few more. GSPP's ambitious adjacent housing complex, including residential units and parking, would be approximately 220 gsf. So, with the subterranean parking tossed in on the Goldman side, we see a GSPP/Stanley size ratio of  $220+40 / 285 = 0.91$ . Should we imagine Stanley Hall lying on its side?

### 13. Drive-by transportation analysis

The DSEIR informs us (p 161) that Fehr & Peers, UCB's go-to traffic consultant, collected peak-period vehicle counts at four LHPS/L parking driveways on May Day last year. They figured that, with the loss of 207 existing parking spaces, trip-generation numbers will drop once the new housing complex opens its doors. Whoopee! But it's too early to celebrate. A look back at the July 2000 DEIR for the Goldman Annex project shows at least a couple paragraphs devoted to parking in the vicinity. Why parking is addressed in a small Goldman project but not a huge one is baffling. Was F&P's myopia related to their own failings or that of whomever wrote their contract and paid their fees?

IND 152.3

### 14. Unnoticed neighbors

More on the myopia theme: the two CEQA public hearings revealed more than we ever wanted to know about the Physical & Environmental Planning (PEP) team's interest in exposing UCB's project plans to the public. We live only a block north of the proposed project site, yet we received no hardcopy notice for either public hearing. As far as we know, none of our neighbors received any notice either—except for a couple on Ridge Road. In the good old days, we would find postcards from PEP in our mailbox.

IND 152.4

### 15. Hearings in Kamchatka

Adding to the insult were the hearing venues. The first hearing—intended originally to be the only one—was tucked into the Alumni House across campus on a Berkeley City Council evening. Objections from Councilmembers shamed PEP into serving up a second helping nine days later. The venue for that hearing, Room 150, University Hall on Addison Street, was no closer to the project site than the first, although it was closer to City Hall.

### 16. Retail window vs wholesale back door

For us, the real eye-opener (or stick-in-the-eye?) came several days after public hearing #1. We were tipped off by a *Daily Cal* piece devoted to a UC Regents meeting at UCLA on Wednesday, March 13<sup>th</sup>, **ONE DAY AFTER THE FIRST PUBLIC HEARING**. Lo and behold, we learn that GSPP Dean Brady and UCB Vice Chancellor Rosemarie Rae regaled the Finance and Capital Strategies Committee (F&CSC) with the wonders of the Upper Hearst Development project. The whole scheme and its considerable benefits are summarized in a nine-page package (Discussion Item F7) from UC's Office of the President (UCOP). If only the poor schmucks who schlepped to the Alumni House the previous evening had known about CEQA's back door.

### 17. P3 to the rescue

Word-for-word, UCOP's tidy F&CSC discussion item yields far more useful information than the voluminous DSEIR. For instance, its Executive Summary declares: "This project is delivered through a public-private partnership and funded through a third-party debt financing structure, supplemented with equity from GSPP's fundraising efforts." Hmmmm. Why don't we see that juicy tidbit anywhere in the DSEIR? Reading on, we discover that Goldman was outbid in 2014 on a 12,800-sq-ft property three blocks away on Euclid Avenue. An attempt to lease 20k sq ft of space from the nearby Church Divinity School similarly collapsed.

IND 152.5

### 18. Texas-style outsourcing

A March 2017 RFQ eventually brought American Campus Communities into Goldman's orbit. Austin TX-based ACC is a publicly-traded real-estate investment trust that has become a big player in the burgeoning "P3" industry. It develops and owns both on- and off-campus dormitories for universities eager to outsource the risk and financial responsibility for new dorm construction and management. Wikipedia cites ACC as the largest private dormitory manager in the country by the end of 2016. The new 700+-bed Blackwell Hall, on Dana between Bancroft and Durant, is an ACC project.

### 19. Alabama-style financing

The F7 revelations continue in an "Ownership and Financing Structure" paragraph:

The land and parking garage will be ground leased from the University to Collegiate Housing Foundation (CHF), a qualified nonprofit 501(c)(3) organization, and the project is proposed to be financed through the issuance of tax-exempt bonds. The development team, led by ACC, will develop and manage the construction of all components of the project on behalf of CHF. . . Rental revenues from the new apartments would support the debt service of the parking structure, and maintenance, operations, and debt service of the housing construction. CHF will own the project until the project debt is repaid. The apartments will be operated and managed by ACC . . .

CHF is based in Fairhope AL.

### 20. UCOP has fallen for P3s

Back in July 2010, UCOP's Budget and Capital Resources operation released "Private Public Partnerships at the University of California." Revised in June 2013, the document claims that UC had successfully employed or was in the process of planning 81 Public Private Partnerships throughout the state. Under "Critical Factors" it suggested that for UC, the use of a PPP is most effective for projects that:

- Are situated off-campus on land not owned by UC; and/or
- Generate stable income; and/or
- Represent a building type commonly developed privately, such as rental housing, commercial office buildings, hotels, and generic lab facilities.

## 21. Indebtedness beyond the horizon

Within UCOP's P3 publication are three case studies which illustrate the use of PPPs at UC. One of them is a 545-unit, 1564-bed student housing project at UC Irvine that utilized a ground lease on 24 acres. It began service in 2006. Total project cost worked out to just over \$58k per bed. The project was developed by an arm of ACC under a contract with CHF, the project manager. It was financed with a 30-year, tax-exempt bond issue. IS THIS A LIKELY MODEL FOR THE UPPER HEARST DEVELOPMENT? UCOP's F7 item says that upon repayment of the project debt, the ground lease with the owner will terminate and project ownership will transfer back to UCB. (If we all should live so long.) Note that CHF's original underwriter for the project was the now-defunct Lehman Brothers.

IND 152.6

## 22. Built-in escape hatch

Embedded in the 2017 RFQ, and repeated numerous times in subsequent documents and public hearings, is the notion that the Proposed Project will develop housing appropriate for new faculty, visiting scholars, graduate students and postdoctoral scholars. Subtext: upscale tenants = upscale rents. "If feasible, the project will offer rents below market rates for these populations either directly or through rent scholarships." But what if scholarships are unavailable or ACC has difficulty filling their new digs with the right people? Not to worry. "The units may be offered to the University population if there is not adequate interest from these groups after good faith marketing efforts," F&CSC members were informed.

## 23. Find your place to love

A glance at ACC's home page < <https://www.americancampus.com/> > rewards the visitor with ear-to-ear collegiate smiles and snappy slogans:

"Find your place to love."

"Where students love living. ® "

IT'S NOT JUST OUR COMPANY TAGLINE. IT'S HOW WE RUN OUR BUSINESS EVERY SINGLE DAY.

We believe every student should love where they live. That's why our number one priority is delivering the best possible experience for students -- at every price point. It's the goal we continually strive for, and the mantra that shapes our values as an operation.

## 24. Landlord from hell?

Despite their considerable self-esteem, ACC as a dorm manager earns but one out of five possible Yelp stars from their residents:

<https://www.yelp.com/biz/american-campus-communities-austin>

1 of 19 reviews

9/29/2018 DO NOT live at any american campus community. I have currently been dealing with my roof leaking for a month now. They have not done anything despite my repeated calls, emails, and talks with maintenance people who are currently doing OTHER jobs. This is ridiculous, I do not ever recommend living at one of these communities, or ever having to deal with any of their employees. The incompetence is astounding.

[https://www.yelp.com/not\\_recommended\\_reviews/american-campus-communities-austin](https://www.yelp.com/not_recommended_reviews/american-campus-communities-austin)

1 of 12 reviews

2/5/2019 If I could give this company 0 stars I wouldn't hesitate. This is the most monopolistic, horrendous, inhumane and quick money scheming company that I've ever encountered. Comcast doesn't compare, Verizon doesn't compare, nothing compares. I wish I could tell you I was being dramatic, but alas, this is the worst organization that has ever existed.

## QUESTIONS CABOOSE

### GSPP

What is the present enrollment at GSPP?  
What was the enrollment at GSPP in 2000?  
How much additional enrollment capacity was made possible by the GSPP Annex?

IND 152.7

What is the present staff count at GSPP?  
What was the staff count at GSPP in 2000?  
How much additional staff capacity was made possible by the GSPP Annex?

What is the present faculty count at GSPP?  
What was the faculty count at GSPP in 2000?  
How much additional faculty capacity was made possible by the GSPP Annex?

Roughly, how many of GSPP's present faculty and staff regularly park at UHPS/L?

IND 152.8

How does GSPP fit into the 1990 LRDP's "precinct" guidelines? Back then, GSPP's location was smack in the "Engineering and Earth Sciences" precinct. "The purpose of organization by precinct is to recognize the existing clusters of uses, and to strengthen them through the assignment of existing space and the allocation of new development sites." (p 4-39). Could you please explain? By this logic, shouldn't GSPP be located closer to Berkeley Law and the Haas School of Business?

IND 152.9

### Public hearings

Who selected the time and place for the first DSEIR public hearing? Was that decision the responsibility of UC Berkeley's Physical & Environmental Planning (PEP) team? Were they not aware that it was a City of Berkeley Council night?

Originally, only one public hearing was contemplated (on March 12<sup>th</sup>) for the DSEIR, correct? Why was the Alumni House selected as the hearing venue and not some room considerably closer to the project site and the affected neighbors? Did UCB originally TRY to get a closer hearing venue? If not, why not?

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152.10



We know of only one pair of neighbors who received hardcopy notice of the first DSEIR public hearing. They happen to live on Ridge Road, directly across the street from the north end of the proposed project. Was there anyone else who received hardcopy notice of the hearing? Do you have a list of noticed residents you could provide? If not, why not?

If this DSEIR is recirculated, is there any chance that future public hearing(s) will be held at a location more convenient to the impacted neighbors?

A second DSEIR hearing was scheduled for March 21<sup>st</sup>. We've heard that it was in response to complaints from the City of Berkeley. Is that true? If so, in the FSEIR (or revised DSEIR) could you please include any correspondence or documentation that COB wanted a second hearing?

Was UCB's noticing procedure for the second DSEIR hearing any more vigorous than for the first one?

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152.10

#### UHPS/L

Barring unforeseen seismic events, how many more years of useful life do university engineers expect the Upper Hearst Parking Structure (UHPS) to provide? How often is UHPS inspected for structural problems? Approximately, what do those inspections cost?

In her comments before the UC Regents F&CSC on March 13<sup>th</sup>, UCB Vice Chancellor of Finance Rosemarie Rae reportedly said that the Upper Hearst Parking Structure has a series of infrastructural flaws. Is this true? If so, could you please document them? Why is there no such information in the DSEIR?

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152.11

In his remarks at the second public hearing, GSPP Dean Henry Brady reported that "we made the decision early on that it was worth paying \$30,000 for each space that was eliminated." Could you please elaborate on the derivation of this number? Does it apply to UCB Parking & Transportation spaces in general or only at specific places on campus? Is there a P&T price difference between covered and uncovered spaces? Can you offer any supporting documents to back up Dean Brady's calculations?

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152.12

Has there been any internal documentation (within P&T or elsewhere) that analyzes the number of F (faculty/staff) and C (central campus) permit users of the UHPS and UHPL facilities? If so, could you please include it in the FSEIR (or recirculated DSEIR)?

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152.13

Professor Eli Yablonovitch suggested at the March 21<sup>st</sup> public hearing that the loss of parking required to facilitate Dean Brady's capital improvements risks triggering the loss of faculty and staff within one of UCB's greatest assets, the College of Engineering. Why wasn't this concern anticipated and addressed in the DSEIR?

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| In addition, Professor Yablonovich expressed doubts about GSPP’s current ability to finance their ambitious project. The first step, he said, “is going to tear down a parking structure that would cost \$20m to replace, which doesn’t make any sense.” Is this cost estimate realistic? | IND<br>152.15 |
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| The recent emergence of an online petition by the Ad Hoc Committee for Review of the GSPP Project to “stop demolition of the Upper Hearst Parking Garage” illuminates some of the unfortunate tradeoffs associated with the proposed project. Some of the 500+ petitioners have included “Reasons for signing” with their ID information. The reasons range from silly to serious, but would it be possible to include comments from the petitioners in the FSEIR or recirculated DSEIR? | IND<br>152.16 |
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### Project design

|                                                                                                                                |               |
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| Without the Minor Amendment to the LRDP, how many dwelling units would be appropriate for this parcel? Is it 40 per acre?      | IND<br>152.17 |
| What, for example, is the comparable allowable density at Cloyne Court? Or on the La Loma side of the Foothill Residence Hall? |               |

### Construction

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| We are told that the maximum grading depth at the Upper Hearst Development site will be 23 feet. Is there any likelihood that the project contemplated will have to dig deeper than that? | IND<br>152.18 |
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| The DSEIR claims that the site will require 20,000 cubic feet of grading and debris removal. For comparison, approximately how much material was removed for the Goldman Annex site? | IND<br>152.19 |
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| What about de-watering machinery? Will it be required permanently on the Proposed Project site? If so, what might be the likely annual operating costs? | IND<br>152.20 |
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| Is it correct that Stanley Hall has permanently installed de-watering machinery in its subterranean levels? If so, can you say (roughly) what this costs to operate annually? |  |
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| Do Stanley Hall’s subterranean levels offer any useful guidance for the below-grade parking contemplated for the GSPP project site? Could you please elaborate? | IND<br>152.21 |
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| What sized trucks (in terms of carrying capacity) are likely to be used in removing the grading materials and concrete pieces? Five cubic feet? Ten cubic feet? Something else? | IND<br>152.22 |
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With the expectation of 20,000 cubic feet of these materials to be removed from the project site, how many individual truck trips does that represent? ↑

During construction, how much of the construction traffic is likely to be directed along the Ridge Road corridor, especially between Euclid and La Loma?. Will the FSEIR (or a revised DSEIR) devote any attention to this? If not, why not? | IND 152.23

During construction, is there any possibility that trucks and machinery can be required to start no earlier than 8am and stop no later than 5pm? If not, what about 7:30am? Will work on weekends be allowed? | IND 152.24

Is there any construction scenario in which the two redwoods adjacent to the UHPS can be saved? If not, why not? | IND 152.25

What about the other street trees adjacent to the project site on La Loma Avenue and Ridge Road?

How much of the streets adjacent (especially Ridge Road and La Loma) to the project site will be rendered unusable during the course of construction? For how long? | IND 152.26

Similarly, what about the sidewalks adjacent to the project site?

Do you anticipate that a crane will be required to construct the Upper Hearst Project? | IND 152.27

Roughly, how many workers do you anticipate will be required at different construction stages of the Proposed Project? How many of them are likely to travel to the site in their own vehicle(s). Where are they likely to park? | IND 152.28

### Traffic/parking

Will the FSEIR (or a revised DSEIR) devote attention to the very tight on-street parking conditions in the area and how they might be impacted by the GSPP project, both during the months of construction and thereafter? If not, why not? Can the excess parking demand from special events like Greek Theatre concerts, commencement, and Memorial Stadium football games be included in the analysis? | IND 152.29

Would it be possible to expand the analysis to include traffic flow estimates before, during, and after the project on nearby residential streets like La Loma, Ridge, Le Roy, Le Conte, and Euclid? | IND 152.30

### Shadow study

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| Will the FSEIR (or a revised DSEIR) include a shadow study of the proposed residential complex? If not, why not? | IND<br>152.31 |
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### Renderings

|                                                                                                                                                                                                                                                                                                                                 |               |
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| Will the FSEIR (or a revised DSEIR) include more renderings of the proposed project in relation to existing nearby structures—ie, on the Hearst, La Loma, and Ridge Road sides? If not, why not? For example, it's very hard to judge how the residential complex will look relative to the existing Foothill dorms on La Loma. | IND<br>152.32 |
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### P3 partners

|                                                                                                                                                                                                                                                                                                                                                                                                      |               |
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| The 2017 RFQ says that the Berkeley campus will seek authority from the UC Regents to enter into a ground lease/development agreement with the selected developer. We know now that ACC is the selected developer. Has a ground lease been signed? If so, could you please include a copy in the FSEIR or a recirculated DSEIR? If not, at what stage in the process might a ground lease be signed? | IND<br>152.33 |
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| Is Blackwell Hall ACC's first housing project on or near the UCB campus? If not, what other projects on or near the UCB campus has ACC participated in or bid on? Do the student residents at Blackwell pay rent directly to ACC or is there some intermediary? | IND<br>152.34 |
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| Does CHF currently participate in any projects on or near the UCB campus? If so, could you please list them? | IND<br>152.35 |
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| UCOP suggests in a 2010/13 document that to succeed, projects delivered under a PPP require a well-thought-through "Basis of Design" document (BOD) that delineates design specifications and operating parameters. Does any BOD currently exist for the Goldman P3 project? If so, could you please include it in the FSEIR or revised DSEIR? If not, is a BOD planned at this time? | IND<br>152.36 |
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### LRDP

|                                                                                                                                                                                                                                                                            |               |
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| The Minor LRDP Amendment looks like a key enabler for this project. Other than for the Aquatics Center on Bancroft, has there been any other time since the 2020 LRDP was created that UCB/UCOP has asked for a Minor Amendment? If so, could you please list the case(s)? | IND<br>152.37 |
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Other

UCOP listed the Upper Hearst Garage as one of nine “Potential Housing Sites” in Table 3 on page 4 of discussion item F1, “UPDATE ON STUDENT HOUSING, BERKELEY CAMPUS” at the 15 March 2017 meeting of the F&CSC. Yet in late June 2018, a UCB RFQ titled “Stage 1 Request for Qualifications: UC Berkeley Housing Initiative” was released in late June 2018. Its Section III B, “Potential Project Sites” lists eight candidate housing sites:

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- a) Channing-Ellsworth
- b) Oxford Tract
- c) Unit 3 Residence Halls (existing housing)
- d) Smyth-Fernwald
- e) People’s Park
- f) Albany Village, Albany
- g) Bancroft & Oxford
- h) Richmond Field Station

Can you please explain why the Upper Hearst Development site didn’t make UCB’s RFQ list?


EECS professor Eli Yablonovitch asserted at the second CEQA hearing that because of the financing difficulties, the parking structure is being torn down to create market-rate housing by an out-of-state developer. “This is not housing that any student can afford,” he stated. Would you please comment on his remark?

IND  
152.39

.....

Thank you for your attention. For my conclusions and recommendations, please return to the first page.

Sincerely,



J M Sharp



Letter IND 153

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Upper Hearst Project Comment

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**Jordan Brooks** <jbrooks@berkeley.edu>

Fri, Apr 12, 2019 at 7:47 AM

To: Planning Departmental &lt;planning@berkeley.edu&gt;

Hello,

I am writing to express my strong support for the Upper Hearst project as a UC Berkeley Transportation Engineering and City Planning alumnus ('17), particularly in light of the College of Engineering's shockingly selfish and self-interested opposition to the project.

Their claim that reducing parking supply will lead to greater VMT goes against basically all research on the subject. There are tons of peer-reviewed, academic articles that show how parking supply and ease of parking is one of the major determinants of mode share, trip generation, and VMT. In addition, when the VMT reductions from more students and faculty living next to campus are considered this project is an even bigger VMT reducer.

With the reduction in parking spaces, people will adjust. Some who otherwise would have driven would now have the ability to live in the Upper Hearst project instead of parking there. For others, those who are relatively indifferent between driving and taking transit will shift modes to take advantage of the BART station in downtown Berkeley.

The concern about disabled parking is a legitimate one, and the remaining spaces at Upper Hearst should provide sufficient spaces for those users. Otherwise, though, the concerns in the letter from the Dean of Engineering are clearly disingenuous and self-interested (in addition to the incorrect assertions about travel behavior). For example, the dueling complaints of "maybe rents will be high" and "maybe UC won't make enough money from this" are a sign that the arguments are not made in good faith.

As I'm sure you're aware, UC Berkeley has had tremendous success in changing the travel behavior of its students and faculty over the years as it has replaced parking with much-needed housing and academic buildings. This admirably serves the school's mission of giving more and more students a top-quality education rather than serve the interest of the faculty in having the most convenient parking. Please continue your support of this mission (and the globally-critical need to reduce VMT and fight climate change) and move forward with the Upper Hearst project.

Sincerely,  
Jordan Brooks  
MS Transportation Engineering '17  
MCP Transportation Planning and Policy '17

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Letter IND 154

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public Comment: Upper Hearst Development Project**

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**Kathleen McGuire** <kfmcg@pacbell.net>

Fri, Apr 12, 2019 at 2:52 PM

Reply-To: Kathleen McGuire &lt;kfmcg@pacbell.net&gt;

To: planning@berkeley.edu

I am lifelong resident of Berkeley and long time resident of the Elmwood, as well as UC Berkeley alumna (MBA '84). I've had a front row seat to observe the impact UC Berkeley has on our community, for good and ill. Recent increases in enrollment have strained our neighborhoods to the breaking point. It is not reasonable for the University of California to embark on a major development project and to plan further enrollment increases without in depth study of the impact on all of us, residents and students alike, and without a comprehensive plan to mitigate the effects.

IND  
154.1

Kathleen McGuire  
2705 Piedmont Avenue  
Berkeley



Letter IND 155

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Public comments: Upper Hearst Development Project**

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**Schmidt, Laura** <Laura.Schmidt@ucsf.edu>  
To: "planning@berkeley.edu" <planning@berkeley.edu>

Fri, Apr 12, 2019 at 12:10 PM

Dear UCB Planning,

I am a UCB alumnus and am active in the UC community. I also live in Berkeley Hills, close to your mammoth proposed development. I have seen the pictures and planning documents and frankly, I'm appalled. They show little consideration on the part of the University for how this development will impact residents of our community—the very residents who provide the local property tax base that provides your students and visitors with a host of public services.

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155.1

The proposed Upper Hearst Development Project is too massive, too tall, and architecturally incompatible with the historic Northside neighborhood. If you push forward with this development as it is currently envisioned, I promise you that home owners and residents in the community will come to deeply resent the University and we will be forced to pursue governmental channels to control your efforts to further build unsightly developments such as this.

Please implement the Reduced Scale Alternative and design it with greater sensitivity for the scale and historic fabric of the nearby residential blocks. The Berkeley community understands the University's needs for more housing, parking and development. We just want you to do it in a way that is sensitive to the community of home owners and residents surrounding the community. And I know that the University depends upon the good will of local residents to have our streets filled with parked cars from University day-to-day traffic and your money-making events, as well as the many other inconveniences and externalized costs that the University imposes on local property tax payers.

IND  
155.2

Dr. Laura Schmidt

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Laura A. Schmidt, PhD, MSW, MPH

Professor, Philip R. Lee Institute for Health Policy Studies, Department of Anthropology, History and Social Medicine, and Global Health Sciences

Co-Director, Community Engagement and Health Policy Program, Clinical and Translational Science Institute

[3333 California Street, Suite 265](#)

[San Francisco, CA 94118-1944](#)

[Office](#) (415) 476.0440

Mobile (510) 918-5225

Fax (415) 476-0705

<http://profiles.ucsf.edu/laura.schmidt>

A-742



For assistance, contact:

Ms. Casey Palmer at [casey.palmer@ucsf.edu](mailto:casey.palmer@ucsf.edu)

or

Ms. Pal Shah at [pal.shah@ucsf.edu](mailto:pal.shah@ucsf.edu)

195 The Uplands  
Berkeley, California 94705

April 12, 2019

Raphael Breines, Senior Planner  
Physical & Environmental Planning  
300 A&E Building  
University of California Berkeley (UCB)  
Berkeley, California 94720-1382

Re: Draft Supplemental EIR (Draft SEIR), 2020 LRDP/Upper Hearst  
Development & "Minor" Amendment

Dear Mr. Breines:

Thank you for the time extension for public review of the Draft SEIR. Fortunately, the time extension has stimulated more discussion and concern within the affected Berkeley community. Within the Draft SEIR, whether for the Upper Hearst Development for the Goldman School of Public Policy and Housing Project (Project) presentation of the massive 3-in-1 development, or for the "Minor" Amendment "program" analysis regarding past and future entitlement to increase UCB's student enrollment — the Draft SEIR document appears to be inadequate, mixing apples and oranges i.e. deserving of a restart in terms of defining and addressing significant environmental impacts, including cumulative impacts, of two very different, long-term proposals.

IND 156.1

In regards to the Upper Hearst Project, please note that the "in-house" U.C. Regent's "Discussion Item" prepared for Members of the Finance and Capital Strategies Committee, March 13, 2019, actually gives a more realistic explanation of the Project, disclosing a financial capital-gain basis and arrangement for going-forward (<https://regents.universityofcalifornia.edu/regmeet/mar19/f7.pdf>) i.e. perhaps already on a fast track toward breaking ground?

However, in compliance with the California Environmental Quality Act (CEQA), please consider and respond to the following questions *vis.a.vis* the proposed Project.

1. If a UCB development is intended to be located beyond and/or outside the "Campus Park" and "Hill Campus" and, thus, within "City Environs," then said project proposal is clearly within the zone of the host city i.e. Berkeley *where the significant environmental effects would occur*. Thus, is it not appropriate, in accordance with CEQA, that the City of Berkeley be designated a Responsible Agency with some mutually understood permit

IND 156.2

authority or approval power, so as to participate in a substantial manner with the Lead Agency – U.C. Regents – in identifying impacts, environmental solutions, and determining the final Project (Upper Hearst Development) approvals? ↑

2. In regards to UCB’s increased land holdings, land partnerships, financial investments – monetizing public and private property, and mounting project proposals within the City Environs, and in regards to this proposed Project, has UCB ever held formal consultation with Berkeley regarding Berkeley’s role as a Responsible Agency, sharing CEQA document review and permit authority? And, if so, what is the conclusion regarding Berkeley participatory review authority?

IND 156.3

3. Is Berkeley powerless as the responsible government entity for its own town? For instance, how is it institutionally neighborly, or accountable in regards to the University’s stated ethical values, for the University to disregard California’s local laws and ordinances so that UCB – UC Regents – may unilaterally decide to neglect compliance with Berkeley’s Zoning Ordinance? Does UCB just buy, eminent domain, or accept gifted property within the City Environs and, then, tell the City of Berkeley and its residents that it will ignore Berkeley’s laws? In fact, is it true that the choice Project plan might actually go forward, being contrary to a stated commitment within the 2020 Long Range Development Plan “City Environs Framework” 3.1.14 and its stated “Best Practices”? see Draft DEIR, p. 142:

IND 156.4

“...the Upper Hearst Development would conflict with Continuing Best Practice LU-2-c as it relates to the City of Berkeley’s local zoning because [the] new buildings would be taller than allowed in the R-3 zone and their massing would encroach on required setbacks.”

Furthermore, is it conceivable that UCB – U.C. Regents – might decide to prioritize potential financial streams over local zoning laws so as to be able to fund the Goldman School Project? see Draft DEIR, p. 183?

4. Furthermore, how does UCB’s stated “2020 LRDP Best Practices” to informally consult Berkeley’s Planning and Landmarks Preservation Commissions *before* an EIR document has been issued — suffice? Note: because the Landmarks Commission and the Design Review Committee’s review of the Project proposal was nearly a year before (July 2018) the Project was “jelled,” their comments were minimized and virtually discounted in the Draft SEIR. How is it considered adequate participation and serious commentary, on behalf of both the City of Berkeley’s ↓

IND 156.5

potentially affected governmental operations and its citizen's environmental quality of life, if UCB – U.C. Regents – is not a fully participatory with the City of Berkeley *during* its CEQA environmental review?



5. More specifically, per the Project being proposed to be within Berkeley's "Adjacent Blocks North" (District 7), perhaps the Draft SEIR might acknowledge cumulative impacts upon a unique zone that already serves other nonprofit college, housing, and religious institutions as well as major UCB institutions and operations? Specifically, shouldn't this Draft EIR identify and address, in particular, such cumulative impacts as additional need for *parking*, new electrical and gas stresses, street trash and garbage?

IND 156.6

6. The Draft DEIR proposes to construct a Project for all the wants and needs of the Goldman School, expanding and containing its operations on Hearst Avenue *exclusively within the City Environs*. The vague language in the Draft DEIR states that "... it is anticipated that full growth by the end of the 2023...", yet this not a firm commitment re: the potential for further growth and expansion. If the Project goes forward, would UCB – U.C. Regents – make a contractual commitment for a growth limit?

IND 156.7

7. It is significant that the Goldman School Project proposes to provide an "event space" for 300-450. The Project plans in the Draft EIR also show sizable spaces for a "conference room," a "seminar room," and a "large classroom." Notably, the event space may further isolate the Goldman School from the Campus environment. Questions seem pertinent regarding its environmental impacts *vis.a.vis* competition with other event spaces in the vicinity, parking, etc.? Furthermore, now that the Campus is renting its many available facilities to outside entities (incl. Corey Hall, McLaughlin Hall, Banatao Auditorium) seeking new money-streams, what are the possibilities that the Goldman School event space might become another UCB rental site? And, why would the Goldman School itself not make use of nearby Corey Hall, McLaughlin Hall, Banatao Auditorium? Note: Capital expenditures for the Project could then be saved and, even, possibly reduce the need for 40,000 sq. ft., reducing the height of the Project?

IND 156.8

8. It is sad, nearly incredulous, and a seemingly-untutored-architectural-intelligence, that the inside planners, architects, and financial investors for this Project would craft an addition to the Goldman School (Ernest Coxhead, 1893) so as to aligned be fused with a contemporary parking



IND 156.9

structure/housing project (using concrete hard-edge forms and metal clad sheathing), rather than to seek to enhance the landmark Goldman School. It's like a throw-away of architectural roots that link the University and the Bay Region, *and* the Adjacent Blocks North, all to an irreplaceable heritage. Given that Goldman School building is a Listed California Historical Resource what are the chances that another design team might be selected? Is there not an institutional quest to enhance a proud legacy for future generations at UCB? Please how can the community influence a new design approach?\*

↑  
IND 156.10

In regards to understanding and making comments about the "Minor" Amendment in the Draft DEIR, such an effort would appear to be almost a joke. Firstly, if the intent of the "Minor" Amendment is to entitle UCB's present and future student enrollment, without anyone noticing, this would appear to be a terrific method — to burying such a significant "program" environmental impact into the midst of discussions about the Upper Hearst Development for the Goldman School of Public Policy and Housing Project. Again, it would seem advisable that consideration of such a significant environmental impact as student enrollment increase be discussed in a separate CEQA document. Accordingly, one question follows.

1. How can this Draft EIR be discussed as adequate when the Project dominates its pages and the "program" project of intent to increase student enrollment is not presented in all its aspects: new information, substantial changes, new circumstances, analysis of impacts upon UCB and the surrounding environment, and/or broad policies going forward?

IND 156.11

Thank you for your attention given to these comments and questions.

Sincerely,

*Lesley Emmington*  
Lesley Emmington

CC: City of Berkeley  
Mayor's Planning, LPC

\* Note: Back-in-the-date when Bechtel Engineering Center was being proposed, it was envisioned that it would fit on the spot of the Naval Architecture Building (John Galen Howard, 1914) also a Listed California Historical Resource, now the Richard Blum Center. When Mr. Bechtel, Sr., learned of its significance, he agreed and requested that the Bechtel Engineering Center be adjusted accordingly.



Letter IND 157

Planning Departmental &lt;planning@berkeley.edu&gt;

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**Protesting the Draft SEIU for the northeast side PROJECT - SAVE all UCB TREES**

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**GEOFFREY COOK** <geoffrey.cook@sbcglobal.net>

Fri, Apr 12, 2019 at 1:16 PM

To: "planning@berkeley.edu" &lt;planning@berkeley.edu&gt;, "jm2@berkeley.edu" &lt;jm2@berkeley.edu&gt;, "sierralaw@gmail.com" &lt;sierralaw@gmail.com&gt;, Norah Foster &lt;norahfoster98@yahoo.com&gt;, Arthur Boone &lt;arboone3@gmail.com&gt;

Dear Planners,

I spoke out twice at your public forums to prevent the removal of 22-49 trees from the surrounding areas listed on p.39 of the Draft SEIU. These trees are valuable to the future generations, the whole community of Berkeley and the University. Our air, our heritage and our aesthetics are in jeopardy with the destruction of these beautiful trees. Please help find a solution. I list two possibilities before you start the removal.

The SOLUTION is to 1) either move the trees themselves OR 2) to reduce the footprint of the building making the building base area smaller to avoid tree removal. This could mean also adding another story to the structures to provide space needed for housing offices or parking. I have over 100 signatures petitioning and requesting that you stop this callous removal of the 49 trees, the fine specimen elms, smaller trees and of course the redwoods!!

Please do not remove these trees and or if you can just move them to other locations. Re-plan the building to avoid cutting any trees. I expect a cogent reply with hopes that you can find a solution so that we can preserve our heritage for future generations.

Yours sincerely,

NORAH R.J. Foster

IND  
157.1

## Public Comments: Upper Hearst Development Project

**Reza Alam** <reza.alam@berkeley.edu>

Fri, Apr 12, 2019 at 4:33 PM

To: planning@berkeley.edu

Dear Sir/Madam,  
Here are my comments/questions.

yours  
Reza Alam

- Has there been any study on the effect of upper hearst project and parking relocation on the quality of work or faculties, students and staff?
- Is there any chance that the plan for upper hearst results in faculties showing up less time on campus?
- If yes, then how much is the damage (quantitative) of faculties and others showing up less on campus?
- The email we received says foothill, at peak hours, has between 30 and 100 empty spots. I have been to foothill with zero spots available.
  - In what specific days during peak hour the spots have been 100?
  - How is the number "between 30 and 100" free spots in foothill calculated?
  - In what specific dates the number of free spots in foothill measured? And by whom?
  - How is the peak hours defined?

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Foothill in a typical day (12:15pm, March 14, 2019). There were about only 30 spots available

- How much will be the rental of residential buildings in upper hearst location?
  - How much on average per square foot?
  - How many unit types will be there?
  - How much rental cost for each unit type is?
- How much is the affordability of assistant professors for housing? That is, how much can they pay for rentals each month?
  - At the time of hiring
  - based on their home department
- How much below the market rate will these units be offered to faculties/newly hired/staff?

A-749



- What if there are not enough staff/faculties to rent/buy the units? How will the units be filled?
- How many parking is available to each unit?
- How many cars do typical assistant professor families own?
- What should those newly hired facilities do if they need to have more than one car?
- Is there any study on how change in the parking due to upper hearst project can result in renewed or increase interest of faculties/staff who are currently leaving far from campus to move near campus? In other words, is there any chance that with the upper hearst parking replaced by the proposed plan, there is more demand for near campus housing? Can this increase the housing price near campus further hence defying the purpose of the entire project (affordable housing)? Does this trend further increase the property price near campus and in the city of Berkeley?
- Is there any study on the upper hearst parking/building/proposal that has not been released publicly? If yes, why?
- How many faculties/stuff are currently on the waiting list for Clark-Kerr? How much is the current demand for near campus housing?
- In the absence of parking, many will cab/uber in/out. In the morning, likely cabs will come in with passengers and leave empty, and in the afternoon vice-versa. This doubles the traffic in the morning and afternoon, and contributes to the pollution and congestion.
  - Does Upper Hears Project result in heavier traffic in adjacent roads during morning and afternoon commute hours?
  - Does Upper Hears Project result in higher pollution in these areas, and also on UC Berkeley Campus?
  - How much is the increase air pollution?
  - How much is added noise pollution?
  - Does this traffic affect proposed shuttle speed?
  - Does this further increase the time needed for faculty and staff to get to their work place?
  - Is work-hour calculated from when faculties and staff arrive at the parking, or at their offices? What if campus-operated shuttle is stuck in traffic for one our? Is this considered leave of absence for faculties and staff?

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Congested traffic (both ways) on the morning of 04/11/2019 in Gayley road





Letter IND 159

Planning Departmental &lt;planning@berkeley.edu&gt;

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## Concerns about Upper Hearst project

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**Ryan Lovett** <rylo@berkeley.edu>

Fri, Apr 12, 2019 at 4:30 PM

To: Planning Departmental &lt;planning@berkeley.edu&gt;

Hello,

I have grave concerns about the Upper Hearst parking demolition project. I am quite worried that the net removal of 100 parking spots will overload Lower Hearst and other lots around campus. Even with stacked parking under current circumstances it can be difficult to find a spot. I fear that with the permanent removal of 100 space one will need to arrive at and depart from campus two hours earlier. This would be a huge lifestyle change for myself and would alter my work schedule. I would not be able to attend to faculty and students in the late afternoon as a result. It will also be impossible for me to return to work should I need to leave for medical appointments and errands.

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159.1

I understand the need for new construction, however I think campus should retain the same number of parking spaces.

Thank you for soliciting our feedback.

Ryan



Letter IND 160

Planning Departmental &lt;planning@berkeley.edu&gt;

## Parking (and the Upper Hearst Structure)

David Romer &lt;dromer@econ.berkeley.edu&gt;

Mon, Apr 15, 2019 at 11:13 AM

To: swilmot@berkeley.edu, airmartinez@berkeley.edu, planning@berkeley.edu

Dear Director Wilmot, Oversight Committee members, and Berkeley planners:

I am quite concerned about the parking situation on campus. This entire semester, it has often been difficult to find parking in prime hours even with a "C" permit. On several occasions, I have had to go to multiple lots. In addition, I have often had the experience of taking the last spot, or only getting a spot because someone happened to be leaving. (I usually park at Bancroft, but I have also had difficulties at Upper Hearst, RSF, and Underhill.) It is detrimental to the mission of the University for faculty and staff to have to spend 15 or 30 minutes searching for a place to park rather than focusing on their teaching and research, or if their schedules are made more complicated and challenging by always having to allow extra time whenever they go to campus.

All of this leads to the main thing I want to say: Given that parking is already problematic, it is important to do more than just partly offset the loss of the Upper Hearst Structure—the goal should be to more than offset it. If the University only partially offsets the loss, parking is likely to go from a moderate impediment to a major problem for many faculty and staff.

I realize that space is at a premium, but there are certainly steps that could be taken to improve the situation. Here are five measures that might help (though there are surely others):

- Adding more attendants. An obvious example is the Bancroft Structure, which has often had an attendant in the past but does not currently have one.
- Negotiating access to substantially more than the 150 spaces at Maxwell Family Field that were referred to as a "minimum" in the recent CALmessages email, and adding an attendant there to allow even more parking.
- Converting some spots from "F" to "C" permits. Again, the Bancroft Structure is a clear example—it used to be entirely for C permits, but a row was converted to F permits a few years ago.
- Significantly reducing the number of spots that are reserved for various special uses, many of which are usually unoccupied.
- Raising the price of C permits so that some faculty and staff for whom parking is not a high priority switch to F permits or find other ways of getting to campus. Space on or next to campus is a very scarce resource, and it is completely appropriate for faculty and staff who want to be confident they will be able to park there without great effort pay an amount that reflects that reality.

I realize that it is easy to view faculty complaints about parking problems as inevitable and not something to be taken seriously. But the current parking system is already problematic and doing some damage to what we are trying to accomplish at the University, and losing more spots would risk of making the situation far worse.

Sincerely,

David Romer

Professor of Economics

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160.1



Letter IND 161

Planning Departmental &lt;planning@berkeley.edu&gt;

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## re Public Comments/Upper Hearst Development Project

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**Marlena Telvick** <marlenatelvick@berkeley.edu>

Mon, Apr 15, 2019 at 9:06 AM

To: planning@berkeley.edu

Love the idea of more housing, but honestly Lower Hearst garage is packed by 9am every day, every floor. Those of us who pay \$1K a year for parking who are already often forced to double-park and hand over our keys (if we're lucky) will now also have to compete with the hundreds of cars who won't be able to park at Upper Hearst anymore.

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It seems unfair.

--

Marlena Telvick  
UC Berkeley Graduate School of Journalism  
121 North Gate Hall MC 5860  
University of California  
Berkeley, CA 94720  
Tel. (510) 643-9411  
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PUBLIC MEETING  
CALIFORNIA ENVIRONMENTAL QUALITY ACT

UNIVERSITY of CALIFORNIA at BERKELEY  
ALUMNI HOUSE, BERKELEY  
MARCH 12, 2019

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REPORTED BY: SANDRA S. PETRITSCH, CSR NO. 11684  
FILE NO. AD026F5

A P P E A R A N C E S:

UNIVERSITY of CALIFORNIA at BERKELEY:

JOHN ARVIN, Associate Vice Chancellor

KYLE GIBSON, Director of Communications

RAPHAEL BREINES, Senior Planner

PUBLIC SPEAKERS:

NORAH FOSTER

MARK McDONALD

LYDIA SOHN

KE XU

HENRY DeNERO

BOB GOMEZ

DANIELLA THOMPSON

AIDAN HILL

CHRISTOPHER ADAMS

STEVEN FINACOM

RICHARD JACKSON

CHRISTOPHER MACY

JOAN GUILFORD

LESLEY EMMINGTON

MICHAEL KATZ

1           BERKELEY, CA; TUESDAY, MARCH 12, 2019; 6:30 p.m.

2  
3                           PUBLIC MEETING COMMENTS

4                                   --oOo--

5                   MR. GIBSON:   Norah Foster.

6                   NORAH FOSTER:   My name is Norah Foster.   You  
7   know, as the great humanist Erasmus said, In Praise of  
8   Folly -- Folly was a woman -- so I'm bravely daring to  
9   come up and speak about North Hearst.   And the first  
10   thing, I want you to look out the windows, you see are the  
11   green branches of these trees.   These trees are precious.  
12   They're our heritage.   They're Earth's way of replenishing  
13   the oxygen that is coming into our great breathing space.  
14   We need to preserve every tree.   And I'm speaking of my  
15   friend, Mr. Arthur Moon (phonetic), who plants trees in  
16   Oakland as a project.

17                   So what I would suggest and like to particularly  
18   criticize is that forty-nine trees were unlawfully  
19   removed -- cut down -- in People's Park and around a giant  
20   sequoia and two coastal live oaks.   These are heritage  
21   trees.   I was reading in the report that, on page 39,  
22   landscaping and streetscape that up to forty-nine trees  
23   are to be removed to put in the cement monstrosity.   We  
24   have overpopulated our campus.

25                   The enrollment question is reduce the

PH1.1

1 enrollment. Not increase the enrollment. I realize that  
2 this isn't the place for enrollment issues, but I think  
3 that's primary as well. We have too many people and too  
4 many students for our enrollment. I think ten thousand  
5 that you mentioned, but that included some of the  
6 surrounding neighborhoods. It's just too many people, so  
7 we should reduce our enrollment. Back to page 39, up to  
8 forty-nine trees within the adjacent project site would be  
9 removed.

PH1.2

10 And this includes the camperdown elm tree with  
11 its distinctive crowns and contorted branches and weeping  
12 habit is a mature and prominent sample of a common tree  
13 species, as well character defining for Beta Theta Pi's  
14 house landscape. It has historical value and this tree  
15 qualifies as a specimen tree. So not only are they  
16 removing trees that just give us air and give us oxygen,  
17 they are removing specimen trees that are sacred on  
18 campus. So what I would like to ask is that, first of  
19 all, you not remove any trees. You preserve all trees and  
20 plant more. I understand there are some mitigation and  
21 I've read this.

PH1.3

22 In Praise of Folly, I support Julia Dent Grant  
23 (phonetic). Bless her heart. And I would have loved to  
24 have read her poem about People's Park. I'll be back with  
25 that later. But let's keep the trees. Keep the trees,

1 Folks.

2 MR. GIBSON: Thank you, Norah. Next speaker is  
3 Mark McDonald.

4 MARK McDONALD: My name is Mark McDonald, just  
5 like the hamburgers. But don't blame me. I was here  
6 before. I live and work in Berkeley and I've been here  
7 forty-five years. I pay taxes, I volunteer, and I served  
8 on a commission for eight years. I really like Berkeley.  
9 I like the mix of campus; you know, eclectic artists and  
10 workers of small business. I've lived in other campus  
11 towns and hosted. I did read a lot of the SEIR, and I'm  
12 concerned and don't get it.

13 As I understood it, there was an agreement  
14 between the university and the city to have thirty-three  
15 thousand students by next year. We're at forty-one  
16 thousand. I really have a lot more respect for the  
17 university's math department. There is something amiss  
18 here, plus I did happen to notice that state residents are  
19 being reduced and bringing in more foreign students for  
20 more money. Okay, money problems. I get it.

21 I do believe the money problems could be  
22 connected to a lot of the scandals that I've read in the  
23 papers over the last years. The president's one hundred  
24 and seventy-five million slush pond and previous President  
25 Dynes' three hundred million missing, and the retire and

PH1.4



1 re-hire scam. I would like to know how that works. They  
2 have money issues, but I think they could run a tighter  
3 ship.

4 Another item I want to criticize about the  
5 SEIR, when The Regents vote, which we assume they will,  
6 it's going to be a green light for student housing.  
7 Which, to me, they're still be thinking about People's  
8 Park. I really can't believe this. We've been through  
9 this so many times. I feel like I'm more connected to  
10 the community than I am to the campus culture, and I do  
11 think there is kind of a seething resentment out there.  
12 The university is just walking over the town. I mean  
13 it's just so crowded everywhere you go. Housing prices  
14 is just so unbelievable. You're looking at a millionaire  
15 right now, and I get dirty for a living.

16 The thing is I just don't think -- I mean when  
17 they went for the oak trees, that was a two-year police  
18 action with people in the trees. I didn't really know  
19 those trees that well before that. South Africa's name?  
20 That was a week of riots and pitch battles and people  
21 injured and finally the university divested and Nelson  
22 Mandela was out of a 27-year-prison sentence in a month.

23 The thing is I know there is support out there  
24 for People's Park that I did not sense for the other  
25 stuff, so I am wary. I don't know how many millions was

PH1.5

1 spent over all of that time enforcing that decision to  
2 build a sports facility, but I am wary that they are even  
3 considering doing People's Park. It's iconic. It's part  
4 of a whole history in story and generation and part of a  
5 fabric and personality of this town. I really hope you'll  
6 reconsider that. Thank you very much.

PH1.6

7 MR. GIBSON: Next up we have Lydia Sohn.

8 LYDIA SOHN: Hello, everyone. My name is Lydia  
9 Sohn, and I'm a professor in the mechanical engineering  
10 department. I work in Etcheverry Hall. My husband works  
11 in the NanoLab at Surtardja Dai Hall. We are being  
12 negatively impacted, as well as our colleagues. And as my  
13 husband's colleagues, in the NanoLab, by a reduction in  
14 parking. I would like to say that it's something that  
15 impacts many of us who are working mothers and working  
16 parents who have small children, who are not able get to  
17 campus on time. Essentially we all know it's a  
18 misunderstood role. Most of the professors and staff, if  
19 you don't get to campus by 9 a.m., you've lost your chance  
20 for parking. What that results in is that even if you  
21 have CRF parking permits it still means that you're  
22 driving a lot around. Many of us have to leave for  
23 business-related meetings in San Francisco or elsewhere  
24 and we have to come back in the middle of the day and  
25 there is no parking. I have literally spent an hour at

PH1.7

1 times looking for parking all over campus. And I am  
2 paying money for parking and I feel that's a very negative  
3 impact on my work, as well as it affects my students. My  
4 graduate and undergraduate students. The people that I  
5 teach.

6 Again, there are people who I know who have  
7 young children such as myself who have to rush off to  
8 school sometimes when there is an emergency. If you're  
9 asking us to park at Clark Kerr, close up to Abby or, I  
10 believe, Maxwell. And there is going to be some kind of  
11 shuttle bus that runs every 20 minutes. Every minute  
12 counts if your child is in distress at school, as well as  
13 other people have children who are in special school  
14 scenarios.

15 So I would like the campus to consider how will  
16 it accommodate the loss of three hundred parking spots and  
17 how it will negatively impact us working mothers and  
18 caregivers. Thank you.

19 MR. GIBSON: Thank you, Lydia.

20 Our next speaker is Ke Xu.

21 KE XU: Hi, my name is Ke Xu. First name K-e  
22 and last name X-u. I'm a professor with the chemistry  
23 department. And same issue with parking. If they remove  
24 three hundred parking spots, and also during the  
25 construction, there will be no place for people to park.

PH1.7

1 So parking actually is the most important thing at  
2 Berkeley. I'll point out the most important job for the  
3 president is dealing with parking for the faculty. And  
4 it's unbelievable that it was trying to remove three  
5 hundred parking spots immediately from the central park  
6 position, if everyone parked at that time.

7 Well, there will be no other way for people to  
8 park, so parking is a key issue here. But somehow people  
9 here try to avoid this very issue and sweep it under the  
10 rug. The most important problem for this particular  
11 project and if you look through, there will be a lot of  
12 comments from the people. There will be a lot of  
13 complaining everywhere and see a lot of traffic jams  
14 everywhere inside the campus and it will create a really  
15 negative environment for everyone. Not only the faculty,  
16 but for the students and everyone. All residents of  
17 Berkeley.

18 People's Park is really for Berkeley. Whoever.  
19 But, if you ask me, there will be no way of finding any  
20 parking position at all and everybody would be really mad  
21 if we lost donations because of driving the project. With  
22 donations we could never find a way to park. Not to speak  
23 of the faculty fee, it will also be highly inconvenient if  
24 you remove so many parking spaces. Thank you.

25 MR. GIBSON: This speaker is Henry DeNero.

1           MR. DeNERO: My name is Henry DeNero. I live at  
2   2695 Le Conte Avenue; two blocks from campus and one block  
3   from post project. Notwithstanding the parking issue;  
4   hopefully, the university will find a way to make up a  
5   loss for the parking, but there is a need for additional  
6   student and faculty housing. And housing, in general, in  
7   the area. I'm one of the many neighbors on the northside  
8   of campus who would actually support this project on a  
9   reduced scale version.

10           And specifically I think we would get widespread  
11   support from the northside community, if you were to adopt  
12   the reduced scale alternative or some very close hybrid of  
13   that. The apartment building is the primary issue of La  
14   Loma and the bridge. Four stories is okay as an apartment  
15   building. A five-story apartment building would be out of  
16   proportion to the surrounding buildings in the area. And  
17   a six-story apartment building would be a disaster.

18           We've been told by staff that there really is an  
19   intention to do five and that's still too high. We'd  
20   recommend you look very strongly at four-story  
21   alternative, either with a footprint or without a  
22   footprint, which means 10 or 15 percent reduction in the  
23   number of apartments. I think you're a long way toward  
24   getting the neighborhood to enthusiastically support the  
25   university, if you did that.

1           I have a couple of questions that I would like  
2 answered in public comment. I think we should clarify  
3 that it's very unclear. The EIR. The artist's rendering  
4 appears to be a four-story apartment building at the  
5 corner of Regional and La Loma. Although the EIR says  
6 five or six, the drawing looks like it's four. I would  
7 like that clarified. I would like the 72- and 69-foot  
8 height clarified. So the height of the six-story  
9 version; and, therefore, what would the height of the  
10 five-story version be and what would the height of the  
11 four-story version be, if you went with the scale  
12 alternative? Thank you very much.

13           MR. GIBSON: Our next speaker is Bob Gomez.

14           BOB GOMEZ: Hi. My name a Bob Gomez. I live in  
15 Berkeley here on Walnut Street. I am a retired civil  
16 engineer and do volunteer work building passes on the  
17 hills and volunteer at the high school. I'm here tonight  
18 to address the enrollment increase, and we need some  
19 answers. We can keep increasing enrollment at Berkeley  
20 and other U.C. campuses, but with more students comes more  
21 impact on our community. We all know that. But there is  
22 a bigger issue that must be addressed. We need to find  
23 out how to get the most for our money when it comes to an  
24 undergraduate education; in other words, to borrow a term  
25 from the Pentagon, more bang for our buck.

1           The California master of plans for higher  
2 education was adopted in 1960. I'm sure you'll agree that  
3 a lot has changed since 1960. Consider that the community  
4 college charge about a tenth of the tuition of the U.C.s.  
5 Check it out yourself. A tenth. What if the community  
6 college has got a bigger slice of the funding pie and  
7 played a bigger role in undergraduate education? What if  
8 a student spent the first two years of college in a  
9 community college followed by a transfer to a U.C. or a  
10 state university campus?

11           What if the community colleges were empowered to  
12 grant bachelor's degrees in computer science? Oh, my God.  
13 Again, we need to take a fresh look at higher education  
14 statewide. A very fresh, very strategic, very gainful  
15 look at where we're spending our education dollars.  
16 Lastly, why do the regents approve moving more students  
17 than the campus with such a high-seismic risk where U.C.'s  
18 own seismic specialists get consulted? I think we need  
19 some answers. Thank you.

20           MR. GIBSON: Our next speaker is Daniella  
21 Thompson.

22           DANIELLA THOMPSON: My name is Daniella  
23 Thompson. I live on La Conte Avenue, a block away from  
24 the project site. I administer three e-mail group lists  
25 for northside neighbors that have altogether about three

1 hundred subscribers. Of all of the neighbors that I've  
2 asked, only one household received notification of the EIR  
3 and the public hearing. So I would like to say that  
4 noticing is quite inadequate. I myself was notified by  
5 e-mail because I asked the U.C. planning office to send me  
6 notification. So the day that they announced it, I went  
7 to their Web site and downloaded the EIR document.

8 Because I downloaded it then, I never went back  
9 there and so I didn't realize there was going to be a  
10 second public hearing. Nobody seems to know about it  
11 except for the few who arrived here because they heard it  
12 through the grapevine. So noticing is definitely  
13 inadequate. Another thing that is inadequate is the  
14 treatment in EIR of the cultural resources on the  
15 northside neighborhood, which is very very poorly  
16 researched. Left out dozens of historic structures, and I  
17 think it just seems to give short shrift to the notions  
18 just paying lip service to the CEQA requirements without  
19 actually following them.

20 So I would like to concur with what Henry DeNero  
21 said. Most of the people in the neighborhood have nothing  
22 against new housing or new academic buildings provided  
23 that they are on a reasonable scale and fit in design-wise  
24 with the rest of the neighborhood, so we're asking that  
25 you implement the reduced scale alternative with a



1 four-story apartment building and a three-story academic  
2 building. And we also would like to see the university  
3 deal better with the design of those buildings. We know  
4 the university has been able to do it in the past.

5 The Channing and Bowman apartments fit in very  
6 nicely with a story context of the school across the  
7 street. The housing across the street from the project  
8 site. Foothill housing. It's not perfect; but, at least,  
9 it makes an effort to fit in. The Ida L. Jackson building  
10 is another example. The university has been able to do  
11 this in the past and we just don't see why you can't do it  
12 again. Thank you.

13 MR. GIBSON: Our next speaker is Aidan Hill.

14 AIDAN HILL: Good evening, everyone. My name is  
15 Aidan Hill. I'm a former candidate for Berkeley's city  
16 counsel representing District 7, which the university  
17 includes; as well as I live off Dwight Way just below  
18 Telegraph, and I've been active with the People's Park  
19 community for the last five months or so. I'm also a  
20 student at U.C. Berkeley and was impacted by the counsel  
21 non-payment policy. And my financial aid is up in the  
22 air. I've been trying to get back into U.C. Berkeley,  
23 after being displaced because of the housing crisis;  
24 however, despite me being a student and being displaced by  
25 the housing crisis, I overwhelmingly believe that People's

1 Park should be preserved just as-is. And so do many  
2 members of the community.

3 People's Park was born in the dream of common  
4 space and is utilized daily by activists, students,  
5 artists, and musicians over the last 50 years. The park  
6 has then become the only open space within Berkeley's City  
7 Counsel District No. 7. But neighboring parks being in  
8 District No. 4 and Willard in District No. 8. On January  
9 2nd, the university began its destruction of trees on the  
10 east end of the park despite overwhelming community  
11 objections.

12 Likewise, on January 15th, the university came  
13 in before dawn to cut more than thirty trees down with  
14 more than one hundred university police California Highway  
15 Patrol officers escorting a non-union tree cutting service  
16 to cut down the cultural significance of the community.  
17 The biodiversity on the east side is significant and has  
18 included eighteen different native plant community groups,  
19 including redwood forest sections in order to scale how it  
20 would be like to go through a national park within the  
21 California region, which you can find only at People's  
22 Park.

23 The future of student engagement is important to  
24 People's Park; not only for its biological necessity, but  
25 the types of activities provided by the open and public

1 spaces that the park provides. The community asks the  
2 following questions that must be answered before any  
3 discussion about ... (unintelligible) comes to the table:  
4 For example, where can we have a daytime drop center for  
5 about fifty to two hundred people near the Telegraph  
6 district, if this park is displaced?

7           Where can the community have cultural gathering  
8 revenues holding at least three hundred people that allows  
9 pre-amplified sound? Where can groups such as ...  
10 (unintelligible) find free food service for about  
11 seventy-five people per day? The distribution of free  
12 clothes on south side, mental health counselor, daytime  
13 napping areas, public sports facilities, basketball,  
14 Frisbee, yoga, community garden pots and food grown,  
15 carbon offsets and oxygen bars will need to be  
16 compensated.

17           Water drainage that the park naturally provides,  
18 public restrooms, and what I believe is most important  
19 emergency gathering sites in times of natural and manmade  
20 disasters. Knowing that People's Park is the only area in  
21 which it has low ground where people can gather in case of  
22 a natural disaster. The only other places that they can  
23 go, if People's Park is destroyed is Clark Kerr or Willard  
24 Park or Abby Park or the university itself. Likewise, I  
25 believe that the university community can engage in

1 productive and peaceful strategies to connect with one  
2 another using People's Park.

3 So just remember that we can have collective  
4 engagement with People's Park, including access to the  
5 work room that People's Park community numbers don't  
6 currently have access to tools for gardening, as well as  
7 the natural disaster sites for smog and relief. And I  
8 just hope that you would all consider that People's Park  
9 is a historical landmark and needs to be protected for  
10 emergencies, especially during times of climate change.  
11 Thank you.

12 MR. GIBSON: Our next speaker is Christopher  
13 Adams.

14 CHRISTOPHER ADAMS: I don't wish to speak this  
15 evening.

16 MR. GIBSON: Thank you, Christopher.

17 Our next speaker is Steven Finacom.

18 STEVEN FINACOM: I'm here representing the  
19 landmarks preservation commissioner for the City of  
20 Berkeley. I also sit on the design review committee of  
21 the city and in all of its capacities, I saw the project  
22 presented last year when it came to both commissions.  
23 There is a letter from the landmarks commission. It's too  
24 long to read in two minutes, so I'll present it  
25 incorporated by reference in my comments.

1 But, to summarize, the landmarks commission is  
2 not opposed to the project in terms of creating additional  
3 academic space or creating additional housing here.  
4 However, the project as proposed is too large and too  
5 massive and looms over the historic resources in the  
6 vicinity, including the original home of public policy at  
7 Beta Theta Pi house. And the skin of the building, the  
8 architectural character, has nothing whatsoever to do with  
9 the architectural character of the neighborhood. This is  
10 one of our, at least most important, historic  
11 neighborhoods.

12 Berkeley is famous, in a design sense, because  
13 of the architectural styles that were developed by people  
14 living in the neighborhood and created and spread out  
15 throughout the city and elsewhere. At the design review  
16 committee, I asked the architect if he had been given  
17 anything by the university about the history of the  
18 neighborhood and its design context during the design  
19 competition and he said, "No." And I asked him if he knew  
20 anything about the history of this neighborhood and he  
21 paused and then he said or he made sort of a mumbling  
22 reference to knowing about Mr. Maybeck and that was it.

23 The landmarks commission supports this project  
24 or thinks that the alternative or reduced scale  
25 alternative could work, if the skin of the building is

1 redone and if the masking of the scale is redone to better  
2 accommodate the surrounding historic resources and  
3 neighborhood. And that's all spelled out in the letter.

4 Since you've presented that alternative, it's  
5 something that's worth seriously pursuing and not just on  
6 paper to be studied and projected. I want to make one  
7 final personal comment on this. When I worked for the  
8 university, an informal part of my job was forecasting  
9 the likelihood of historic era resources being found  
10 underground when the campus develops other sites, I got  
11 pretty good at this based on a whole set of factors to  
12 evaluate.

13 And the campus has done many construction  
14 projects over the past twenty-five years and, on many  
15 occasions, has dug into historic resources underground.  
16 Buried convent, remains of 19th Century mansions, and all  
17 sorts of interesting things. One way that the university  
18 dealt with this was to do archeological field research,  
19 which usually took place in the summer, on project sites  
20 where the archeological research facility would come in  
21 with a group of students and would do essentially a real  
22 life dig, excavate the site, and then it would be turned  
23 over to construction.

24 Just to wrap that up, that was done several  
25 times. It was very successful and big academic benefit,

1 and the campus should really consider that as  
2 another historic mitigation. It's highly likely it will  
3 dig into the foundations of Newman Hall that used to be on  
4 this site and also the Newman Hall Rectory, which is next  
5 door. Thank you.

6 MR. GIBSON: Our next speaker is Richard  
7 Jackson.

8 RICHARD JACKSON: Good evening. I'm Richard  
9 Jackson, a physician, and live over on La Conte Avenue. I  
10 can't say that I came prepared to make comments to the  
11 gentleman from design review. He's just gone through what  
12 I want to re-enforce. Size is so important and it is  
13 overwhelming to the northside. It needs to fit in. I  
14 remember, at one point, arguing with an architect saying,  
15 the building you're putting in doesn't look anything like  
16 the neighborhood. And he looked at me and said, "You mean  
17 you want me to be derivative?" I said, yes. I want it to  
18 look like it belongs here and fits in. The size is much  
19 too large.

20 The second thing is the work on Hearst Avenue,  
21 and I understand what was behind that, has driven an  
22 enormous amount of traffic in to the northside. I think  
23 La Loma has become the beginning of the giant slalom  
24 because on La Conte Avenue people come flying down there  
25 and my wife has had a near miss. Because of the amount of

1 traffic being dumped on here, and \$4 million has been  
2 spent on that, no one has thought about how to control the  
3 traffic into the neighborhoods. And it's gone up  
4 dramatically.

5 I guess the last thing is I'm not so worried  
6 about enough parking, but I am delighted to know that  
7 there would be more year around housing. I love students,  
8 but I think people who actually live here and are around  
9 on the weekends and around in the summer, care about the  
10 community more than folks who are here temporarily. I say  
11 that with love and respect for all of the students, but  
12 the community's sense is that it's so important to all of  
13 us.

14 That site across from Founders Rock is sacred  
15 and the view from there should be as beautiful. Thank you  
16 so much for your work.

17 MR. GIBSON: Next up we have Christopher Macy.

18 CHRISTOPHER MACY: Hi. I've been involved in  
19 the park for a while and used to be with the university  
20 once a month. And I want to talk about the cultural  
21 aspect. Somebody already mentioned and this is the 50th  
22 anniversary of the park. And I would hope that we take a  
23 much longer view of its significance as we play out the  
24 end game of a warmongering culture, which is what the park  
25 was versed out of. Resistance to nature.



1           I think in the long stretch of history this is  
2 going to be pretty important compared to housing more  
3 students and the university very much a business. That's  
4 destroying the planet now and we're living on such  
5 economic thin ice that, to me, People's Park is trying to  
6 get ahead of the curve with homeless people and I would  
7 like to see a lot more happen. This anniversary is a  
8 giant. We should talk about what it will cost to occupy.  
9 We organize ourselves to make it a People's Park. And  
10 maybe we do have a building there, but it will be a  
11 People's Park.

12           And we find a way to deal with some very hard  
13 times ahead of us. We are \$20 trillion in debt in this  
14 country and only Americans live in this kind of denial and  
15 I think we should appreciate what we have before we lose  
16 it here in the long view, which is what the university is  
17 supposed to be about.

18           MR. GIBSON: Our next speaker is Joan Guilford.

19           JOAN GUILFORD: So I'm Joan Guilford. My  
20 husband Dick Jackson just spoke a bit ago, and I live on  
21 La Conte Avenue. And we are both Cal graduates and we  
22 have deep fondness of this campus. We understand the  
23 space needs. But living on the La Conte slalom, it is a  
24 deep concern to us how the project is the size or scale of  
25 that and the traffic and parking impacts. About three

1 years ago we went to a public meeting about the Hearst  
2 re-design project -- Hearst Avenue re-design project --  
3 and we said it's really critical to have more safety for  
4 the students and pedestrians, but have you thought about  
5 what this is going to do to driving traffic on to the  
6 neighborhood streets? And, they said, "Well, that's out  
7 of our scope."

8 So what we're living with right now is that  
9 out-of-scope. So I think what's important for the  
10 university to realize is that it is a collaboration of the  
11 university, the city, and the community and particularly  
12 the northside residents that are really feeling this  
13 impact. When I looked at the EIR, it really focuses and  
14 talks about the daily scene in park, but it focuses on a  
15 very tiny part of that. So I think it's really critical  
16 to look at the bigger piece. And part of that is design,  
17 part of that is parking, and part of that is traffic.

18 We can't have all of those additional units  
19 being discussed and additional event space for three  
20 hundred people and think that's not going to have an  
21 impact. Thank you.

22 MR. GIBSON: Our next speaker is Lesley  
23 Emmington.

24 LESLEY EMMINGTON: So I prepared a letter to try  
25 to be concurrent with my own thoughts. So I'll read a few

1 paragraphs or as much as I can. The upper Hertz  
2 development is in fact a jarring, massive, broodless  
3 structure that is attached to a common tasteless,  
4 oversized housing complex. Indeed, as the SEIR  
5 establishes, the upper Hertz development would virtually  
6 diminish the historic and inspirational character of one  
7 of Berkeley's most important seminal structures: The Beta  
8 Theta Pi fraternity of 1894, now the Golden School of  
9 Public Policy.

10 And, yes, as proposed the Upper Hearst  
11 development would adversely dominate all corners of the  
12 surrounding environment. And, yes, the project would also  
13 diminish a fragile, yet still existent, historic interface  
14 between the university's U.C. Berkeley Campus Park and the  
15 city's historic northside neighborhood.

16 Yet now is the time to ask what is the  
17 justification to go forward with the upper Hearst  
18 development as proposed, if the SEIR deems that it will  
19 have a significant and unavoidable impact? Is it to  
20 further denigrate a cherished, irreplaceable, and  
21 significant environment that's further denigrated? If  
22 not, then, is there an urgency to expand the Golden School  
23 of Public Policy to build housing immediately? Are there  
24 time-sensitive donations attached? Or is there an urgency  
25 to construct the adjoining housing and parking complexes?

1           Is there an urgency to monetize U.C.'s property  
2 holdings linking such property to housing investment and  
3 profit returns as soon as possible, as Chancellor Chris  
4 has spoken? Is there a time-sensitive deal or contract  
5 waiting in the wings? Is there investment money that must  
6 be utilized a.s.a.p.? If the answers to any or all of the  
7 above questions are in the negative, then new opportunity  
8 should be given, including extended time to redesign the  
9 upper Hearst development, including its facade, its  
10 footprint, and its massing.

11           Towards this end, the Berkeley Architectural  
12 Heritage Association's SEIR comment letter is most  
13 helpful. Using old photographs the letter reveals that in  
14 the sixties, when U.C. took domain of this block and this  
15 site and proceeded to actually demolish standing historic  
16 structures that were each institutional facilities  
17 inclusive of large gathering spaces and substantial  
18 student housing units. That's Newman Hall, College Hall;  
19 and, of course, Beta Theta Pi. Each was designed -- then  
20 to enhance the hillsides, the spirit, and the beautiful  
21 rhythms of building with nature. I wish I could read my  
22 next paragraph, but --

23           AUDIENCE: I donate my time.

24           LESLEY EMMINGTON: Oh, nice. Okay, thank you.

25           At this time, might it be possible for U.C.'s

1 administration and planning leadership to re-emerge and  
2 respect concerns expressed by the Berkeley community?  
3 Actually, wouldn't the Goldman School teach its students  
4 that respect for environmental footprints wherever, local  
5 or worldwide, is basic to good policy, good citizenship  
6 individually and institutionally. Wouldn't the Goldman  
7 Environmental Fund advocate such aspirations too? Perhaps  
8 there might be a dust-off memory to remember when proposed  
9 developments along the Hearst corridor were tweaked,  
10 adjusted, and/or radically redirected to preserve and  
11 protect irreplaceable architectural resources.

12           Isn't it worth recalling the dynamic campaign to  
13 save the Naval architecture building, currently part of  
14 the Blum Center for developing economics. And the  
15 adoptive reuse of North Gate Hall, once home to the  
16 architecture department and currently the graduate school  
17 of journalism and in the conscious effort to build the  
18 Foothill housing complex to be contextually sensitive.

19           Then too there is the contextual award-winning  
20 addition to the Goldman School undertaken by the  
21 architectural firm's architectural resources group. So,  
22 yes, there are possibilities; but I hope it's not this  
23 one. Thank you.

24           MR. ARVIN: I think that's the last speaker we  
25 have; is there anyone else that would like to speak? One

1 more coming up.

2 MR. GIBSON: Michael Katz.

3 MICHAEL KATZ: Thank you. I'm a U.C. Berkeley  
4 alumni and resident and member. And all I came prepared  
5 to say is that for the Hearst project they can select a  
6 reduced scale alternative. What I didn't come prepared to  
7 say is that I received a really good, really affordable  
8 graduate education on this campus. In the next 20 hours,  
9 I have the privilege and necessity to decide between two  
10 or three really good job offers that go directly back to  
11 my education here. And very grateful for it.

12 The university has not been shy about asking me  
13 for alumni support over the years and I've tried to be as  
14 generous as I can because I'm grateful. It's gotten hard  
15 in recent years and after the destruction of ...  
16 (unintelligible) and waiting for a white elephant sports  
17 complex right on the Hayward fault that the university  
18 will be paying for, at least, for 99 years for housing and  
19 probably academic, as well as recreational sports budget.

20 I guess it's hard when the university talks of  
21 compromising or completely paving over the space of the  
22 city. Many of alumni love the university and Berkeley so  
23 much that we live in Berkeley so I would just ask the  
24 university to please be sensitive about our community,  
25 whether people living around or alumni or U.C. staff or

1 faculty or just members of the community.

2 The university does have a constitutional  
3 exemption from local zoning which might not last given the  
4 housing prices, so I would ask you to please act as if  
5 we're subject to the zoning . . . (unintelligible).

6 MR. ARVIN: Any more public speakers? Seeing  
7 none that will wrap up our hearing tonight. Thank you all  
8 for coming and providing your comments. I'll remind you  
9 that you may continue to provide your comments by  
10 e-mailing us. The deadline for submitting all comments is  
11 April 8th and also we'll be having a second public hearing  
12 like this on March 21st in University Hall at 6:30 p.m.

13 (TIME NOTED: 7:36 p.m.)  
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REPORTER'S CERTIFICATE

I, SANDRA S. PETRITSCH, CSR No. 11684, Certified  
Shorthand Reporter, certify;

That the foregoing meeting was stenographically  
reported by me at the time and place therein set forth and  
were thereafter transcribed;

That the foregoing is a true and correct  
transcript of my shorthand notes so taken.

I further certify that I am not a relative or  
employee of any of the parties nor financially interested  
in the action.

I declare under penalty of perjury under the  
laws of California that the foregoing is true and correct.

Dated this 1st day of April, 2019.

  
SANDRA S. PETRITSCH, CSR No. 11684





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|--------------------------|------------------------|-------------------------|--------------------------|-------------------------|
| a.m 7:19                 | area 10:7,16 16:20     | bravely 3:8             | city's 24:15             | contorted 4:11          |
| a.s.a.p 25:6             | areas 16:13            | breathing 3:13          | civil 11:15              | contract 25:4           |
| Abby 8:9 16:24           | arguing 20:14          | BREINES 2:6             | clarified 11:7,8         | control 21:2            |
| able 7:16 14:4,10        | arrived 13:11          | bridge 10:14            | clarify 11:2             | convent 19:16           |
| academic 13:22 14:1      | art 11:3               | bringing 5:19           | Clark 8:9 16:23          | corner 11:5             |
| 18:3 19:25 27:19         | Arthur 3:15            | broodless 24:2          | climate 17:10            | corners 24:11           |
| access 17:4,6            | artists 5:9 15:5       | buck 11:25              | close 8:9 10:12          | correct 29:9,15         |
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PUBLIC MEETING

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CALIFORNIA ENVIRONMENTAL QUALITY ACT

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UNIVERSITY of CALIFORNIA at BERKELEY

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MARCH 12, 2019

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| <p>1                   A P P E A R A N C E S:</p> <p>2</p> <p>3       UNIVERSITY of CALIFORNIA at BERKELEY:</p> <p>4       JOHN ARVIN, Associate Vice Chancellor</p> <p>5       KYLE GIBSON, Director of Communications</p> <p>6       RAPHAEL BREINES, Senior Planner</p> <p>7</p> <p>8       PUBLIC SPEAKERS:</p> <p>9       NORAH FOSTER</p> <p>10       MARK McDONALD</p> <p>11       LYDIA SOHN</p> <p>12       KE XU</p> <p>13       HENRY DeNERO</p> <p>14       BOB GOMEZ</p> <p>15       DANIELLA THOMPSON</p> <p>16       AIDAN HILL</p> <p>17       CHRISTOPHER ADAMS</p> <p>18       STEVEN FINACOM</p> <p>19       RICHARD JACKSON</p> <p>20       CHRISTOPHER MACY</p> <p>21       JOAN GUILFORD</p> <p>22       LESLEY EMMINGTON</p> <p>23       MICHAEL KATZ</p> <p>24</p> <p>25</p> <p>Page 2</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>1       enrollment. Not increase the enrollment. I realize that</p> <p>2       this isn't the place for enrollment issues, but I think</p> <p>3       that's primary as well. We have too many people and too</p> <p>4       many students for our enrollment. I think ten thousand</p> <p>5       that you mentioned, but that included some of the</p> <p>6       surrounding neighborhoods. It's just too many people, so</p> <p>7       we should reduce our enrollment. Back to page 39, up to</p> <p>8       forty-nine trees within the adjacent project site would be</p> <p>9       removed.</p> <p>10       And this includes the camperdown elm tree with</p> <p>11       its distinctive crowns and contorted branches and weeping</p> <p>12       habit is a mature and prominent sample of a common tree</p> <p>13       species, as well character defining for Beta Theta Pi's</p> <p>14       house landscape. It has historical value and this tree</p> <p>15       qualifies as a specimen tree. So not only are they</p> <p>16       removing trees that just give us air and give us oxygen,</p> <p>17       they are removing specimen trees that are sacred on</p> <p>18       campus. So what I would like to ask is that, first of</p> <p>19       all, you not remove any trees. You preserve all trees and</p> <p>20       plant more. I understand there are some mitigation and</p> <p>21       I've read this.</p> <p>22       In Praise of Folly, I support Julia Dent Grant</p> <p>23       (phonetic). Bless her heart. And I would have loved to</p> <p>24       have read her poem about People's Park. I'll be back with</p> <p>25       that later. But let's keep the trees. Keep the trees,</p> <p>Page 4</p> |
| <p>1       BERKELEY, CA; TUESDAY, MARCH 12, 2019; 6:30 p.m.</p> <p>2</p> <p>3       PUBLIC MEETING COMMENTS</p> <p>4       --oOo--</p> <p>5       MR. GIBSON: Norah Foster.</p> <p>6       NORAH FOSTER: My name is Norah Foster. You</p> <p>7       know, as the great humanist Erasmus said, In Praise of</p> <p>8       Folly -- Folly was a woman -- so I'm bravely daring to</p> <p>9       come up and speak about North Hearst. And the first</p> <p>10       thing, I want you to look out the windows, you see are the</p> <p>11       green branches of these trees. These trees are precious.</p> <p>12       They're our heritage. They're Earth's way of replenishing</p> <p>13       the oxygen that is coming into our great breathing space.</p> <p>14       We need to preserve every tree. And I'm speaking of my</p> <p>15       friend, Mr. Arthur Moon (phonetic), who plants trees in</p> <p>16       Oakland as a project.</p> <p>17       So what I would suggest and like to particularly</p> <p>18       criticize is that forty-nine trees were unlawfully</p> <p>19       removed -- cut down -- in People's Park and around a giant</p> <p>20       sequoia and two coastal live oaks. These are heritage</p> <p>21       trees. I was reading in the report that, on page 39,</p> <p>22       landscaping and streetscape that up to forty-nine trees</p> <p>23       are to be removed to put in the cement monstrosity. We</p> <p>24       have overpopulated our campus.</p> <p>25       The enrollment question is reduce the</p> <p>Page 3</p> | <p>1       Folks.</p> <p>2       MR. GIBSON: Thank you, Norah. Next speaker is</p> <p>3       Mark McDonald.</p> <p>4       MARK McDONALD: My name is Mark McDonald, just</p> <p>5       like the hamburgers. But don't blame me. I was here</p> <p>6       before. I live and work in Berkeley and I've been here</p> <p>7       forty-five years. I pay taxes, I volunteer, and I served</p> <p>8       on a commission for eight years. I really like Berkeley.</p> <p>9       I like the mix of campus; you know, eclectic artists and</p> <p>10       workers of small business. I've lived in other campus</p> <p>11       towns and hosted. I did read a lot of the SEIR, and I'm</p> <p>12       concerned and don't get it.</p> <p>13       As I understood it, there was an agreement</p> <p>14       between the university and the city to have thirty-three</p> <p>15       thousand students by next year. We're at forty-one</p> <p>16       thousand. I really have a lot more respect for the</p> <p>17       university's math department. There is something amiss</p> <p>18       here, plus I did happen to notice that state residents are</p> <p>19       being reduced and bringing in more foreign students for</p> <p>20       more money. Okay, money problems. I get it.</p> <p>21       I do believe the money problems could be</p> <p>22       connected to a lot of the scandals that I've read in the</p> <p>23       papers over the last years. The president's one hundred</p> <p>24       and seventy-five million slush pond and previous President</p> <p>25       Dynes' three hundred million missing, and the retire and</p> <p>Page 5</p>                                                                    |

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| <p>1 re-hire scam. I would like to know how that works. They<br/>2 have money issues, but I think they could run a tighter<br/>3 ship.</p> <p>4 Another item I want to criticize about the SEIR,<br/>5 when The Regents vote, which we assume they will, it's<br/>6 going to be a green light for student housing. Which, to<br/>7 me, they're still be thinking about People's Park. I<br/>8 really can't believe this. We've been through this so<br/>9 many times. I feel like I'm more connected to the<br/>10 community than I am to the campus culture, and I do think<br/>11 there is kind of a seething resentment out there. The<br/>12 university is just walking over the town. I mean it's<br/>13 just so crowded everywhere you go. Housing prices is just<br/>14 so unbelievable. You're looking at a millionaire right<br/>15 now, and I get dirty for a living.</p> <p>16 The thing is I just don't think -- I mean when<br/>17 they went for the oak trees, that was a two-year police<br/>18 action with people in the trees. I didn't really know<br/>19 those trees that well before that. South Africa's name?<br/>20 That was a week of riots and pitch battles and people<br/>21 injured and finally the university divested and Nelson<br/>22 Mandela was out of a 27-year-prison sentence in a month.</p> <p>23 The thing is I know there is support out there<br/>24 for People's Park that I did not sense for the other<br/>25 stuff, so I am wary. I don't know how many millions was</p> <p>Page 6</p>                                                 | <p>1 times looking for parking all over campus. And I am<br/>2 paying money for parking and I feel that's a very negative<br/>3 impact on my work, as well as it affects my students. My<br/>4 graduate and undergraduate students. The people that I<br/>5 teach.</p> <p>6 Again, there are people who I know who have<br/>7 young children such as myself who have to rush off to<br/>8 school sometimes when there is an emergency. If you're<br/>9 asking us to park at Clark Kerr, close up to Abby or, I<br/>10 believe, Maxwell. And there is going to be some kind of<br/>11 shuttle bus that runs every 20 minutes. Every minute<br/>12 counts if your child is in distress at school, as well as<br/>13 other people have children who are in special school<br/>14 scenarios.</p> <p>15 So I would like the campus to consider how will<br/>16 it accommodate the loss of three hundred parking spots and<br/>17 how it will negatively impact us working mothers and<br/>18 caregivers. Thank you.</p> <p>19 MR. GIBSON: Thank you, Lydia.</p> <p>20 Our next speaker is Ke Xu.</p> <p>21 KE XU: Hi, my name is Ke Xu. First name K-e<br/>22 and last name X-u. I'm a professor with the chemistry<br/>23 department. And same issue with parking. If they remove<br/>24 three hundred parking spots, and also during the<br/>25 construction, there will be no place for people to park.</p> <p>Page 8</p>                                                                                                              |
| <p>1 spent over all of that time enforcing that decision to<br/>2 build a sports facility, but I am wary that they are even<br/>3 considering doing People's Park. It's iconic. It's part<br/>4 of a whole history in story and generation and part of a<br/>5 fabric and personality of this town. I really hope you'll<br/>6 reconsider that. Thank you very much.</p> <p>7 MR. GIBSON: Next up we have Lydia Sohn.</p> <p>8 LYDIA SOHN: Hello, everyone. My name is Lydia<br/>9 Sohn, and I'm a professor in the mechanical engineering<br/>10 department. I work in Etcheverry Hall. My husband works<br/>11 in the NanoLab at Surtardja Dai Hall. We are being<br/>12 negatively impacted, as well as our colleagues. And as my<br/>13 husband's colleagues, in the NanoLab, by a reduction in<br/>14 parking. I would like to say that it's something that<br/>15 impacts many of us who are working mothers and working<br/>16 parents who have small children, who are not able get to<br/>17 campus on time. Essentially we all know it's a<br/>18 misunderstood role. Most of the professors and staff, if<br/>19 you don't get to campus by 9 a.m., you've lost your chance<br/>20 for parking. What that results in is that even if you<br/>21 have CRF parking permits it still means that you're<br/>22 driving a lot around. Many of us have to leave for<br/>23 business-related meetings in San Francisco or elsewhere<br/>24 and we have to come back in the middle of the day and<br/>25 there is no parking. I have literally spent an hour at</p> <p>Page 7</p> | <p>1 So parking actually is the most important thing at<br/>2 Berkeley. I'll point out the most important job for the<br/>3 president is dealing with parking for the faculty. And<br/>4 it's unbelievable that it was trying to remove three<br/>5 hundred parking spots immediately from the central park<br/>6 position, if everyone parked at that time.</p> <p>7 Well, there will be no other way for people to<br/>8 park, so parking is a key issue here. But somehow people<br/>9 here try to avoid this very issue and sweep it under the<br/>10 rug. The most important problem for this particular<br/>11 project and if you look through, there will be a lot of<br/>12 comments from the people. There will be a lot of<br/>13 complaining everywhere and see a lot of traffic jams<br/>14 everywhere inside the campus and it will create a really<br/>15 negative environment for everyone. Not only the faculty,<br/>16 but for the students and everyone. All residents of<br/>17 Berkeley.</p> <p>18 People's Park is really for Berkeley. Whoever.<br/>19 But, if you ask me, there will be no way of finding any<br/>20 parking position at all and everybody would be really mad<br/>21 if we lost donations because of driving the project. With<br/>22 donations we could never find a way to park. Not to speak<br/>23 of the faculty fee, it will also be highly inconvenient if<br/>24 you remove so many parking spaces. Thank you.</p> <p>25 MR. GIBSON: This speaker is Henry DeNero.</p> <p>Page 9</p> |



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| <p>1 MR. DeNERO: My name is Henry DeNero. I live at<br/>2 2695 Le Conte Avenue; two blocks from campus and one block<br/>3 from post project. Notwithstanding the parking issue;<br/>4 hopefully, the university will find a way to make up a<br/>5 loss for the parking, but there is a need for additional<br/>6 student and faculty housing. And housing, in general, in<br/>7 the area. I'm one of the many neighbors on the northside<br/>8 of campus who would actually support this project on a<br/>9 reduced scale version.</p> <p>10 And specifically I think we would get widespread<br/>11 support from the northside community, if you were to adopt<br/>12 the reduced scale alternative or some very close hybrid of<br/>13 that. The apartment building is the primary issue of La<br/>14 Loma and the bridge. Four stories is okay as an apartment<br/>15 building. A five-story apartment building would be out of<br/>16 proportion to the surrounding buildings in the area. And<br/>17 a six-story apartment building would be a disaster.</p> <p>18 We've been told by staff that there really is an<br/>19 intention to do five and that's still too high. We'd<br/>20 recommend you look very strongly at four-story<br/>21 alternative, either with a footprint or without a<br/>22 footprint, which means 10 or 15 percent reduction in the<br/>23 number of apartments. I think you're a long way toward<br/>24 getting the neighborhood to enthusiastically support the<br/>25 university, if you did that.</p> <p>Page 10</p> | <p>1 The California master of plans for higher<br/>2 education was adopted in 1960. I'm sure you'll agree that<br/>3 a lot has changed since 1960. Consider that the community<br/>4 college charge about a tenth of the tuition of the U.C.s.<br/>5 Check it out yourself. A tenth. What if the community<br/>6 college has got a bigger slice of the funding pie and<br/>7 played a bigger role in undergraduate education? What if<br/>8 a student spent the first two years of college in a<br/>9 community college followed by a transfer to a U.C. or a<br/>10 state university campus?</p> <p>11 What if the community colleges were empowered to<br/>12 grant bachelor's degrees in computer science? Oh, my God.<br/>13 Again, we need to take a fresh look at higher education<br/>14 statewide. A very fresh, very strategic, very gainful<br/>15 look at where we're spending our education dollars.<br/>16 Lastly, why do the regents approve moving more students<br/>17 than the campus with such a high-seismic risk where U.C.'s<br/>18 own seismic specialists get consulted? I think we need<br/>19 some answers. Thank you.</p> <p>20 MR. GIBSON: Our next speaker is Daniella<br/>21 Thompson.</p> <p>22 DANIELLA THOMPSON: My name is Daniella<br/>23 Thompson. I live on La Conte Avenue, a block away from<br/>24 the project site. I administer three e-mail group lists<br/>25 for northside neighbors that have altogether about three</p> <p>Page 12</p>                                                                                       |
| <p>1 I have a couple of questions that I would like<br/>2 answered in public comment. I think we should clarify<br/>3 that it's very unclear. The EIR. The artist's rendering<br/>4 appears to be a four-story apartment building at the<br/>5 corner of Regional and La Loma. Although the EIR says<br/>6 five or six, the drawing looks like it's four. I would<br/>7 like that clarified. I would like the 72- and 69-foot<br/>8 height clarified. So the height of the six-story version;<br/>9 and, therefore, what would the height of the five-story<br/>10 version be and what would the height of the four-story<br/>11 version be, if you went with the scale alternative? Thank<br/>12 you very much.</p> <p>13 MR. GIBSON: Our next speaker is Bob Gomez.</p> <p>14 BOB GOMEZ: Hi. My name a Bob Gomez. I live in<br/>15 Berkeley here on Walnut Street. I am a retired civil<br/>16 engineer and do volunteer work building passes on the<br/>17 hills and volunteer at the high school. I'm here tonight<br/>18 to address the enrollment increase, and we need some<br/>19 answers. We can keep increasing enrollment at Berkeley<br/>20 and other U.C. campuses, but with more students comes more<br/>21 impact on our community. We all know that. But there is<br/>22 a bigger issue that must be addressed. We need to find<br/>23 out how to get the most for our money when it comes to an<br/>24 undergraduate education; in other words, to borrow a term<br/>25 from the Pentagon, more bang for our buck.</p> <p>Page 11</p>     | <p>1 hundred subscribers. Of all of the neighbors that I've<br/>2 asked, only one household received notification of the EIR<br/>3 and the public hearing. So I would like to say that<br/>4 noticing is quite inadequate. I myself was notified by<br/>5 e-mail because I asked the U.C. planning office to send me<br/>6 notification. So the day that they announced it, I went<br/>7 to their Web site and downloaded the EIR document.</p> <p>8 Because I downloaded it then, I never went back<br/>9 there and so I didn't realize there was going to be a<br/>10 second public hearing. Nobody seems to know about it<br/>11 except for the few who arrived here because they heard it<br/>12 through the grapevine. So noticing is definitely<br/>13 inadequate. Another thing that is inadequate is the<br/>14 treatment in EIR of the cultural resources on the<br/>15 northside neighborhood, which is very very poorly<br/>16 researched. Left out dozens of historic structures, and I<br/>17 think it just seems to give short shrift to the notions<br/>18 just paying lip service to the CEQA requirements without<br/>19 actually following them.</p> <p>20 So I would like to concur with what Henry DeNero<br/>21 said. Most of the people in the neighborhood have nothing<br/>22 against new housing or new academic buildings provided<br/>23 that they are on a reasonable scale and fit in design-wise<br/>24 with the rest of the neighborhood, so we're asking that<br/>25 you implement the reduced scale alternative with a</p> <p>Page 13</p> |

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| <p>1 four-story apartment building and a three-story academic<br/>2 building. And we also would like to see the university<br/>3 deal better with the design of those buildings. We know<br/>4 the university has been able to do it in the past.</p> <p>5 The Channing and Bowman apartments fit in very<br/>6 nicely with a story context of the school across the<br/>7 street. The housing across the street from the project<br/>8 site. Foothill housing. It's not perfect; but, at least,<br/>9 it makes an effort to fit in. The Ida L. Jackson building<br/>10 is another example. The university has been able to do<br/>11 this in the past and we just don't see why you can't do it<br/>12 again. Thank you.</p> <p>13 MR. GIBSON: Our next speaker is Aidan Hill.</p> <p>14 AIDAN HILL: Good evening, everyone. My name is<br/>15 Aidan Hill. I'm a former candidate for Berkeley's city<br/>16 counsel representing District 7, which the university<br/>17 includes; as well as I live off Dwight Way just below<br/>18 Telegraph, and I've been active with the People's Park<br/>19 community for the last five months or so. I'm also a<br/>20 student at U.C. Berkeley and was impacted by the counsel<br/>21 non-payment policy. And my financial aid is up in the<br/>22 air. I've been trying to get back into U.C. Berkeley,<br/>23 after being displaced because of the housing crisis;<br/>24 however, despite me being a student and being displaced by<br/>25 the housing crisis, I overwhelmingly believe that People's</p> <p>Page 14</p> | <p>1 spaces that the park provides. The community asks the<br/>2 following questions that must be answered before any<br/>3 discussion about ... (unintelligible) comes to the table:<br/>4 For example, where can we have a daytime drop center for<br/>5 about fifty to two hundred people near the Telegraph<br/>6 district, if this park is displaced?</p> <p>7 Where can the community have cultural gathering<br/>8 revenues holding at least three hundred people that allows<br/>9 pre-amplified sound? Where can groups such as ...<br/>10 (unintelligible) find free food service for about<br/>11 seventy-five people per day? The distribution of free<br/>12 clothes on south side, mental health counselor, daytime<br/>13 napping areas, public sports facilities, basketball,<br/>14 Frisbee, yoga, community garden pots and food grown,<br/>15 carbon offsets and oxygen bars will need to be<br/>16 compensated.</p> <p>17 Water drainage that the park naturally provides,<br/>18 public restrooms, and what I believe is most important<br/>19 emergency gathering sites in times of natural and manmade<br/>20 disasters. Knowing that People's Park is the only area in<br/>21 which it has low ground where people can gather in case of<br/>22 a natural disaster. The only other places that they can<br/>23 go, if People's Park is destroyed is Clark Kerr or Willard<br/>24 Park or Abby Park or the university itself. Likewise, I<br/>25 believe that the university community can engage in</p> <p>Page 16</p> |
| <p>1 Park should be preserved just as-is. And so do many<br/>2 members of the community.</p> <p>3 People's Park was born in the dream of common<br/>4 space and is utilized daily by activists, students,<br/>5 artists, and musicians over the last 50 years. The park<br/>6 has then become the only open space within Berkeley's City<br/>7 Counsel District No. 7. But neighboring parks being in<br/>8 District No. 4 and Willard in District No. 8. On January<br/>9 2nd, the university began its destruction of trees on the<br/>10 east end of the park despite overwhelming community<br/>11 objections.</p> <p>12 Likewise, on January 15th, the university came<br/>13 in before dawn to cut more than thirty trees down with<br/>14 more than one hundred university police California Highway<br/>15 Patrol officers escorting a non-union tree cutting service<br/>16 to cut down the cultural significance of the community.<br/>17 The biodiversity on the east side is significant and has<br/>18 included eighteen different native plant community groups,<br/>19 including redwood forest sections in order to scale how it<br/>20 would be like to go through a national park within the<br/>21 California region, which you can find only at People's<br/>22 Park.</p> <p>23 The future of student engagement is important to<br/>24 People's Park; not only for its biological necessity, but<br/>25 the types of activities provided by the open and public</p> <p>Page 15</p>                                                                 | <p>1 productive and peaceful strategies to connect with one<br/>2 another using People's Park.</p> <p>3 So just remember that we can have collective<br/>4 engagement with People's Park, including access to the<br/>5 work room that People's Park community numbers don't<br/>6 currently have access to tools for gardening, as well as<br/>7 the natural disaster sites for smog and relief. And I<br/>8 just hope that you would all consider that People's Park<br/>9 is a historical landmark and needs to be protected for<br/>10 emergencies, especially during times of climate change.<br/>11 Thank you.</p> <p>12 MR. GIBSON: Our next speaker is Christopher<br/>13 Adams.</p> <p>14 CHRISTOPHER ADAMS: I don't wish to speak this<br/>15 evening.</p> <p>16 MR. GIBSON: Thank you, Christopher.<br/>17 Our next speaker is Steven Finacom.</p> <p>18 STEVEN FINACOM: I'm here representing the<br/>19 landmarks preservation commissioner for the City of<br/>20 Berkeley. I also sit on the design review committee of<br/>21 the city and in all of its capacities, I saw the project<br/>22 presented last year when it came to both commissions.<br/>23 There is a letter from the landmarks commission. It's too<br/>24 long to read in two minutes, so I'll present it<br/>25 incorporated by reference in my comments.</p> <p>Page 17</p>                                                                                                                                                                                |

1 But, to summarize, the landmarks commission is  
2 not opposed to the project in terms of creating additional  
3 academic space or creating additional housing here.  
4 However, the project as proposed is too large and too  
5 massive and looms over the historic resources in the  
6 vicinity, including the original home of public policy at  
7 Beta Theta Pi house. And the skin of the building, the  
8 architectural character, has nothing whatsoever to do with  
9 the architectural character of the neighborhood. This is  
10 one of our, at least most important, historic  
11 neighborhoods.

12 Berkeley is famous, in a design sense, because  
13 of the architectural styles that were developed by people  
14 living in the neighborhood and created and spread out  
15 throughout the city and elsewhere. At the design review  
16 committee, I asked the architect if he had been given  
17 anything by the university about the history of the  
18 neighborhood and its design context during the design  
19 competition and he said, "No." And I asked him if he knew  
20 anything about the history of this neighborhood and he  
21 paused and then he said or he made sort of a mumbling  
22 reference to knowing about Mr. Maybeck and that was it.

23 The landmarks commission supports this project  
24 or thinks that the alternative or reduced scale  
25 alternative could work, if the skin of the building is

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1 redone and if the masking of the scale is redone to better  
2 accommodate the surrounding historic resources and  
3 neighborhood. And that's all spelled out in the letter.

4 Since you've presented that alternative, it's  
5 something that's worth seriously pursuing and not just on  
6 paper to be studied and projected. I want to make one  
7 final personal comment on this. When I worked for the  
8 university, an informal part of my job was forecasting the  
9 likelihood of historic era resources being found  
10 underground when the campus develops other sites, I got  
11 pretty good at this based on a whole set of factors to  
12 evaluate.

13 And the campus has done many construction  
14 projects over the past twenty-five years and, on many  
15 occasions, has dug into historic resources underground.  
16 Buried convent, remains of 19th Century mansions, and all  
17 sorts of interesting things. One way that the university  
18 dealt with this was to do archeological field research,  
19 which usually took place in the summer, on project sites  
20 where the archeological research facility would come in  
21 with a group of students and would do essentially a real  
22 life dig, excavate the site, and then it would be turned  
23 over to construction.

24 Just to wrap that up, that was done several  
25 times. It was very successful and big academic benefit,

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1 and the campus should really consider that as  
2 another historic mitigation. It's highly likely it will  
3 dig into the foundations of Newman Hall that used to be on  
4 this site and also the Newman Hall Rectory, which is next  
5 door. Thank you.

6 MR. GIBSON: Our next speaker is Richard  
7 Jackson.

8 RICHARD JACKSON: Good evening. I'm Richard  
9 Jackson, a physician, and live over on La Conte Avenue. I  
10 can't say that I came prepared to make comments to the  
11 gentleman from design review. He's just gone through what  
12 I want to re-enforce. Size is so important and it is  
13 overwhelming to the northside. It needs to fit in. I  
14 remember, at one point, arguing with an architect saying,  
15 the building you're putting in doesn't look anything like  
16 the neighborhood. And he looked at me and said, "You mean  
17 you want me to be derivative?" I said, yes. I want it to  
18 look like it belongs here and fits in. The size is much  
19 too large.

20 The second thing is the work on Hearst Avenue,  
21 and I understand what was behind that, has driven an  
22 enormous amount of traffic in to the northside. I think  
23 La Loma has become the beginning of the giant slalom  
24 because on La Conte Avenue people come flying down there  
25 and my wife has had a near miss. Because of the amount of

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1 traffic being dumped on here, and \$4 million has been  
2 spent on that, no one has thought about how to control the  
3 traffic into the neighborhoods. And it's gone up  
4 dramatically.

5 I guess the last thing is I'm not so worried  
6 about enough parking, but I am delighted to know that  
7 there would be more year around housing. I love students,  
8 but I think people who actually live here and are around  
9 on the weekends and around in the summer, care about the  
10 community more than folks who are here temporarily. I say  
11 that with love and respect for all of the students, but  
12 the community's sense is that it's so important to all of  
13 us.

14 That site across from Founders Rock is sacred  
15 and the view from there should be as beautiful. Thank you  
16 so much for your work.


17 MR. GIBSON: Next up we have Christopher Macy.

18 CHRISTOPHER MACY: Hi. I've been involved in  
19 the park for a while and used to be with the university  
20 once a month. And I want to talk about the cultural  
21 aspect. Somebody already mentioned and this is the 50th  
22 anniversary of the park. And I would hope that we take a  
23 much longer view of its significance as we play out the  
24 end game of a warmongering culture, which is what the park  
25 was versed out of. Resistance to nature.

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| <p>1 I think in the long stretch of history this is<br/>2 going to be pretty important compared to housing more<br/>3 students and the university very much a business. That's<br/>4 destroying the planet now and we're living on such<br/>5 economic thin ice that, to me, People's Park is trying to<br/>6 get ahead of the curve with homeless people and I would<br/>7 like to see a lot more happen. This anniversary is a<br/>8 giant. We should talk about what it will cost to occupy.<br/>9 We organize ourselves to make it a People's Park. And<br/>10 maybe we do have a building there, but it will be a<br/>11 People's Park.</p> <p>12 And we find a way to deal with some very hard<br/>13 times ahead of us. We are \$20 trillion in debt in this<br/>14 country and only Americans live in this kind of denial and<br/>15 I think we should appreciate what we have before we lose<br/>16 it here in the long view, which is what the university is<br/>17 supposed to be about.</p> <p>18 MR. GIBSON: Our next speaker is Joan Guilford.</p> <p>19 JOAN GUILFORD: So I'm Joan Guilford. My<br/>20 husband Dick Jackson just spoke a bit ago, and I live on<br/>21 La Conte Avenue. And we are both Cal graduates and we<br/>22 have deep fondness of this campus. We understand the<br/>23 space needs. But living on the La Conte slalom, it is a<br/>24 deep concern to us how the project is the size or scale of<br/>25 that and the traffic and parking impacts. About three</p> <p>Page 22</p> | <p>1 paragraphs or as much as I can. The upper Hertz<br/>2 development is in fact a jarring, massive, broodless<br/>3 structure that is attached to a common tasteless,<br/>4 oversized housing complex. Indeed, as the SEIR<br/>5 establishes, the upper Hertz development would virtually<br/>6 diminish the historic and inspirational character of one<br/>7 of Berkeley's most important seminal structures: The Beta<br/>8 Theta Pi fraternity of 1894, now the Golden School of<br/>9 Public Policy.</p> <p>10 And, yes, as proposed the Upper Hearst<br/>11 development would adversely dominate all corners of the<br/>12 surrounding environment. And, yes, the project would also<br/>13 diminish a fragile, yet still existent, historic interface<br/>14 between the university's U.C. Berkeley Campus Park and<br/>15 the city's historic northside neighborhood.</p> <p>16 Yet now is the time to ask what is the<br/>17 justification to go forward with the upper Hearst<br/>18 development as proposed, if the SEIR deems that it will<br/>19 have a significant and unavoidable impact? Is it to<br/>20 further denigrate a cherished, irreplaceable, and<br/>21 significant environment that's further denigrated? If<br/>22 not, then, is there an urgency to expand the Golden School<br/>23 of Public Policy to build housing immediately? Are there<br/>24 time-sensitive donations attached? Or is there an urgency<br/>25 to construct the adjoining housing and parking complexes?</p> <p>Page 24</p> |
| <p>1 years ago we went to a public meeting about the Hearst<br/>2 re-design project -- Hearst Avenue re-design project --<br/>3 and we said it's really critical to have more safety for<br/>4 the students and pedestrians, but have you thought about<br/>5 what this is going to do to driving traffic on to the<br/>6 neighborhood streets? And, they said, "Well, that's out<br/>7 of our scope."</p> <p>8 So what we're living with right now is that<br/>9 out-of-scope. So I think what's important for the<br/>10 university to realize is that it is a collaboration of the<br/>11 university, the city, and the community and particularly<br/>12 the northside residents that are really feeling this<br/>13 impact. When I looked at the EIR, it really focuses and<br/>14 talks about the daily scene in park, but it focuses on a<br/>15 very tiny part of that. So I think it's really critical<br/>16 to look at the bigger piece. And part of that is design,<br/>17 part of that is parking, and part of that is traffic.</p> <p>18 We can't have all of those additional units<br/>19 being discussed and additional event space for three<br/>20 hundred people and think that's not going to have an<br/>21 impact. Thank you.</p> <p>22 MR. GIBSON: Our next speaker is Lesley<br/>23 Emmington.</p> <p>24 LESLEY EMMINGTON: So I prepared a letter to try<br/>25 to be concurrent with my own thoughts. So I'll read a few</p> <p>Page 23</p>                                                    | <p>1 Is there an urgency to monetize U.C.'s property<br/>2 holdings linking such property to housing investment and<br/>3 profit returns as soon as possible, as Chancellor Chris<br/>4 has spoken? Is there a time-sensitive deal or contract<br/>5 waiting in the wings? Is there investment money that must<br/>6 be utilized a.s.a.p.? If the answers to any or all of the<br/>7 above questions are in the negative, then new opportunity<br/>8 should be given, including extended time to redesign the<br/>9 upper Hearst development, including its facade, its<br/>10 footprint, and its massing.</p> <p>11 Towards this end, the Berkeley Architectural<br/>12 Heritage Association's SEIR comment letter is most<br/>13 helpful. Using old photographs the letter reveals that in<br/>14 the sixties, when U.C. took domain of this block and this<br/>15 site and proceeded to actually demolish standing historic<br/>16 structures that were each institutional facilities<br/>17 inclusive of large gathering spaces and substantial<br/>18 student housing units. That's Newman Hall, College Hall;<br/>19 and, of course, Beta Theta Pi. Each was designed -- then<br/>20 to enhance the hillsides, the spirit, and the beautiful<br/>21 rhythms of building with nature. I wish I could read my<br/>22 next paragraph, but --</p> <p>23 AUDIENCE: I donate my time.</p> <p>24 LESLEY EMMINGTON: Oh, nice. Okay, thank you.</p> <p>25 At this time, might it be possible for U.C.'s</p> <p>Page 25</p>          |

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| <p>1 administration and planning leadership to re-emerge and<br/>2 respect concerns expressed by the Berkeley community?<br/>3 Actually, wouldn't the Goldman School teach its students<br/>4 that respect for environmental footprints wherever, local<br/>5 or worldwide, is basic to good policy, good citizenship<br/>6 individually and institutionally. Wouldn't the Goldman<br/>7 Environmental Fund advocate such aspirations too? Perhaps<br/>8 there might be a dust-off memory to remember when proposed<br/>9 developments along the Hearst corridor were tweaked,<br/>10 adjusted, and/or radically redirected to preserve and<br/>11 protect irreplaceable architectural resources.<br/>12 Isn't it worth recalling the dynamic campaign to<br/>13 save the Naval architecture building, currently part of<br/>14 the Blum Center for developing economics. And the<br/>15 adoptive reuse of North Gate Hall, once home to the<br/>16 architecture department and currently the graduate school<br/>17 of journalism and in the conscious effort to build the<br/>18 Foothill housing complex to be contextually sensitive.<br/>19 Then too there is the contextual award-winning<br/>20 addition to the Goldman School undertaken by the<br/>21 architectural firm's architectural resources group. So,<br/>22 yes, there are possibilities; but I hope it's not this<br/>23 one. Thank you.<br/>24 MR. ARVIN: I think that's the last speaker we<br/>25 have; is there anyone else that would like to speak? One</p> <p>Page 26</p> | <p>1 faculty or just members of the community.<br/>2 The university does have a constitutional<br/>3 exemption from local zoning which might not last given the<br/>4 housing prices, so I would ask you to please act as if<br/>5 we're subject to the zoning . . . (unintelligible).<br/>6 MR. ARVIN: Any more public speakers? Seeing<br/>7 none that will wrap up our hearing tonight. Thank you all<br/>8 for coming and providing your comments. I'll remind you<br/>9 that you may continue to provide your comments by<br/>10 e-mailing us. The deadline for submitting all comments is<br/>11 April 8th and also we'll be having a second public hearing<br/>12 like this on March 21st in University Hall at 6:30 p.m.<br/>13 (TIME NOTED: 7:36 p.m.)<br/>14<br/>15<br/>16<br/>17<br/>18<br/>19<br/>20<br/>21<br/>22<br/>23<br/>24<br/>25</p> <p>Page 28</p>                                                     |
| <p>1 more coming up.<br/>2 MR. GIBSON: Michael Katz.<br/>3 MICHAEL KATZ: Thank you. I'm a U.C. Berkeley<br/>4 alumni and resident and member. And all I came prepared<br/>5 to say is that for the Hearst project they can select a<br/>6 reduced scale alternative. What I didn't come prepared to<br/>7 say is that I received a really good, really affordable<br/>8 graduate education on this campus. In the next 20 hours,<br/>9 I have the privilege and necessity to decide between two<br/>10 or three really good job offers that go directly back to<br/>11 my education here. And very grateful for it.<br/>12 The university has not been shy about asking me<br/>13 for alumni support over the years and I've tried to be as<br/>14 generous as I can because I'm grateful. It's gotten hard<br/>15 in recent years and after the destruction of ...<br/>16 (unintelligible) and waiting for a white elephant sports<br/>17 complex right on the Hayward fault that the university<br/>18 will be paying for, at least, for 99 years for housing and<br/>19 probably academic, as well as recreational sports budget.<br/>20 I guess it's hard when the university talks of<br/>21 compromising or completely paving over the space of the<br/>22 city. Many of alumni love the university and Berkeley so<br/>23 much that we live in Berkeley so I would just ask the<br/>24 university to please be sensitive about our community,<br/>25 whether people living around or alumni or U.C. staff or</p> <p>Page 27</p>              | <p>1 REPORTER'S CERTIFICATE<br/>2<br/>3<br/>4 I, SANDRA S. PETRITSCH, CSR No. 11684, Certified<br/>5 Shorthand Reporter, certify;<br/>6 That the foregoing meeting was stenographically<br/>7 reported by me at the time and place therein set forth and<br/>8 were thereafter transcribed;<br/>9 That the foregoing is a true and correct<br/>10 transcript of my shorthand notes so taken.<br/>11 I further certify that I am not a relative or<br/>12 employee of any of the parties nor financially interested<br/>13 in the action.<br/>14 I declare under penalty of perjury under the<br/>15 laws of California that the foregoing is true and correct.<br/>16 Dated this 1st day of April, 2019.<br/>17<br/>18<br/>19<br/>20<br/>21<br/>22<br/>23<br/>24<br/>25</p> <p>SANDRA S. PETRITSCH, CSR No. 11684</p>  <p>Page 29</p> |

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PUBLIC MEETING  
CALIFORNIA ENVIRONMENTAL QUALITY ACT

UNIVERSITY of CALIFORNIA at BERKELEY  
UNIVERSITY HALL, BERKELEY  
MARCH 21, 2019

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REPORTED BY: SANDRA S. PETRITSCH, CSR NO. 11684  
FILE NO. AD026F6

A P P E A R A N C E S :

UNIVERSITY of CALIFORNIA at BERKELEY:

JOHN ARVIN, Associate Vice Chancellor

KYLE GIBSON, Director of Communications

RAPHAEL BREINES, Senior Planner

PUBLIC SPEAKERS:

NORAH FOSTER

SANDI KETCHPEL

HENRY BRADY

JANICE THOMAS

ELIZABETH GENO

SUSAN WENGRAF

FRED DODSWORTH

MARTHA CHAVEZ

RIGEL ROBINSON

DANIELLA THOMPSON

CHARLES PUGH

JIM SHARP

AIDAN HILL

ARTURO FERNANDEZ

TAREK ZOHDI

MARCEL MORAN

JACQUELYN MCCORMICK

ANGIE CHEN

ELI YABLONOVITCH

SCOTT McNALLY

MARGOT SMITH

LESLEY EMMINGTON

RAPHAEL VILLAGRACIA

ANDRES ALBANESE

CAROL STONE

SARAH ABDESHAHIAN

CHRIS CULLANDER

1           BERKELEY, CA; THURSDAY, MARCH 21, 2019; 6:30 p.m.

2  
3                   PUBLIC MEETING COMMENTS

4                           --oOo--

5  
6           MR. GIBSON: Raphael has the microphone. Number  
7 one is Norah Foster, number two is Sandi Ketchpel, number  
8 three is Henry Brady, number four is Janice Thomas, and  
9 number five is Elizabeth Geno.

10           I'll be timing you tonight. As John said, we  
11 plan on giving everyone two minutes and will allow  
12 everyone three minutes for extra time and assist you in  
13 your timing and give you about a minute warning that your  
14 time is nearing.

15           NORAH FOSTER: Hello. My name is Norah Foster  
16 and I've worked at the university for thirty-five years in  
17 the humanities graduate services. And I love trees. And  
18 the full effort at the university of removing forty-nine  
19 trees in People's Park is a travesty. In this SEIR  
20 draft -- mind you, it is a draft, I hope -- the plan on  
21 page 39 is to remove twenty-two trees. One of two Redwood  
22 trees and one specimen elm. A specimen elm is an  
23 extremely important tree and would like to go to forestry  
24 and get those folks to agree.

25           I have a solution, and I know everyone is going

PH2.1

1 to have a giant headache when I tell you what it is, and  
2 that is to redesign the footprint of the building. In  
3 other words, instead of going out go up. You could build  
4 another parking garage. Those people that I know, about  
5 four people who spoke to me about parking issues, you  
6 could build another garage underneath and go to seven  
7 stories. I know this may take a major work, a lot of work  
8 on the part of the university, to redesign the building.  
9 But, with that being said, it's a travesty to take out  
10 these sacred trees. And I think a lot of people would  
11 agree with me. That the trees should not be removed.

12 Furthermore, that we should plant more trees. I  
13 have for you tonight a wonderful poet, named Julia Dent  
14 Grant, who is immortalized for the People's Park people  
15 who remember Osha Newman's wonderful mural Hayes Avenue on  
16 that building. She was there, in People's Park, for that  
17 horrible confrontation.

18 I want to read her poem, "People's Park," that  
19 was read at the 3/12 council meeting. I cried when I read  
20 it. Hold on. Let me bring the poem up. Let the next  
21 person go ahead and I'll get my 30 seconds, when I find  
22 it.

23 MR. GIBSON: Would you like to write it?

24 MS. FOSTER: No. I would like to read it.

25 Thank you, kindly.

PH2.1

1 MR. GIBSON: Our next speaker is Sandi Ketchpel.

2 SANDI KETCHPEL: Hi, there. My name is Sandi  
3 Ketchpel. I'm the assistant dean at the Goldman School  
4 for administration and operations, and I wanted to speak  
5 publicly because I've had some people question the Goldman  
6 School's academic space. I was part of the administration  
7 for -- finally call a new building -- from a decade and a  
8 half now. That new building opened in 2002. And the day  
9 it re-opened, we were provided spaces for student services  
10 and provided space for faculty and provided one general  
11 assignment classroom to the campus and one GSPP classroom.

12 It has not provided any space for visiting  
13 faculty or graduate student instructors. They are  
14 currently still holding office hours in our living room  
15 using portable white boards with students sitting on the  
16 floor in order to get their sections done because spaces  
17 are such a premium. We do not have any space for research  
18 centers. We need research centers with GSRs. At the  
19 moment, it is spread out in four buildings on campus and  
20 research because we can't afford them and we are not  
21 supporting them.

22 It also makes us very vulnerable with other  
23 universities who are trying to recruit our faculty because  
24 they think they have a right to that space for their  
25 faculty and we do not. So there are many many things that

PH2.2

1 we need in this new building and for those people who  
2 don't understand what it is we're lacking, I hope this is  
3 helpful. Thank you.

4 MR. GIBSON: Henry Brady.

5 HENRY BRADY: My name is Henry Brady. I am the  
6 dean at the Goldman School of Public Policy. I graduated  
7 from Cal Berkeley in 1978, so I've been here for forty  
8 years. I want to tell you a little bit about the school,  
9 and a little bit about this project. The Goldman School  
10 is a top-rated public policy school and trains people in a  
11 master's program primarily to work in the non-profit and  
12 public sector, so our students go out and try to make the  
13 world a better place and set goals and really proud of  
14 where they end up. They're in Berkeley, they're in the  
15 Bay Area, and they're in Sacramento, and they're  
16 throughout the state and throughout the nation and the  
17 world.

18 And I believe there have been a lot of great  
19 names in all of the various things that they've been  
20 involved in. The project was designed because people  
21 wanted to do something in the public policy schools. Get  
22 into a public policy school because they wanted to make  
23 the world a better place. The idea was to help campus and  
24 community and that's what we've tried to do. We've tried  
25 to provide some housing which is badly needed in this

PH2.2

PH2.3



1 community. And housing for faculty members, for post docs  
2 or graduate students; and, perhaps, the staff as well.

3 Second, we needed classroom space, as Sandi just  
4 pointed out, and we needed room for teaching and for lab  
5 space. And finally we wanted to deal with parking as  
6 responsibly as we possibly could, recognizing that it was  
7 going to be hard to do all of those things all at once.

8 As I said, housing is for a wide variety of people. The  
9 space will really help us because we need space  
10 desperately for teaching. We have a very large  
11 undergraduate minor. We need space to teach the  
12 undergraduates and masters in public policy and masters in  
13 public affairs. And, as Sandi said, we need research  
14 space for faculty.

15 With parking we made the decision early on that  
16 we would pay \$30,000 for each space that we eliminated.  
17 Very few projects on Berkeley campus made that promise.  
18 We made it, which actually caused us to have a lot of  
19 difficulties to finance the project. I think we're  
20 finally there, but it certainly added a lot of courses to  
21 the projects and other projects have not had to pay.  
22 We've had to pay those costs. So our goal is to have a  
23 project that reflects your goals at the Goldman School,  
24 that is we wanted to do something good for the campus,  
25 something good for the community, and something good for

PH2.3

PH2.4

PH2.5

1 people.

2 And we wanted to solve problems and improve the  
3 world in practical ways. That means compromises had to be  
4 made. The project is not perfect, and I know it's not  
5 perfect, but I think it does a lot of the things that we  
6 set out to do. And we're proud that we tried to do those  
7 things and that we think we succeeded to, at least, some  
8 extent. So thanks for being here tonight. I look forward  
9 to hearing your comments. And I hope that you can see  
10 that we're, at least, trying very very hard to do the best  
11 that we can by the campus and community. Thank you.

12 MR. GIBSON: Next up is Janice Thomas.

13 JANICE THOMAS: Thank you. First off, I'm going  
14 to focus exclusively on the project location maps. Figure  
15 one. And figure maps are extremely important, as you guys  
16 know. And the Goldman School of Public Policy are paying  
17 attention to this analysis, starting with Figure one. I  
18 have a memorandum from the the governor's office of  
19 planning and research, and the subject is location maps.

20 And, in the memorandum, we urge the leading  
21 agency to improve the quality of the map that you include  
22 in your CEQA documents and, at a minimum, the buildings  
23 should contain the geographical features, streets, access  
24 points ... a topographical equation. Let's go to Figure  
25 one. First of all, on Figure one it's called, "Regional

PH2.6

PH2.7

1 Location." There are two maps and should be two figures,  
2 but instead there is figure one that has two maps. And  
3 the regional location map is the tiny one and this big one  
4 right here has Berkeley written in the middle of it and if  
5 you look at this map, you see the highway. That's good.  
6 That's a feature.

7 And then you don't see any roads past east of  
8 Shattuck. As a matter of fact, Shattuck is not on the  
9 map. You have Sixth Street, Seventh Street, Rose, but we  
10 don't have Shattuck. And we also don't have Hearst. By  
11 the way, we also don't have a stadium. Basically, east of  
12 Shattuck, which isn't on there, has disappeared. How are  
13 you going to analyze impact? How broad is the impact  
14 going to be? And how are you going to look at the  
15 interactive pieces of this project so that you can  
16 properly analyze it? You don't have the Greek Theater,  
17 you don't have Lawrence National Laboratory, and you don't  
18 have the forest and hills; so, therefore, any inference  
19 you have, no fire zones can be made.

20 There are some agents that review these things,  
21 that when they look at 176 pages on the Web, they actually  
22 have -- that they actually need -- to get some Gestalt or  
23 holistic picture. If you look at Figure one, you don't  
24 get it. Basically, that's the essence of my comment is  
25 that this is misrepresenting the project right at the

PH2.7

1 get-go. And that really really really really bothered me.  
2 There are two figures on this one figure. Really really  
3 really bothers me. And I do not see how we shed any  
4 comment on the broad analysis -- a little on the canyon.

5 And I can tell you how I'll be impacted; in  
6 fact, I'll be looking to see how far out and how broad  
7 indeed those analyses are because, based on this, this  
8 could be the suburbs. Thank you.

9 MR. GIBSON: While our fifth speaker, Elizabeth  
10 Geno, walks up, I'll call our next five speakers. Number  
11 six is Susan Wengraf, number seven is Fred Dodsworth,  
12 number eight is Martha Chavez, number nine is Margot  
13 Smith, and number ten is Daniella Thompson.

14 ELIZABETH GENO: Hi, I'm Elizabeth Geno. And I,  
15 pretty much, have taken up for affiliation of this place  
16 and graduate of this fine place. By 2002, I've worked  
17 with staff for 19 1/2 years. I'm also on the major ... an  
18 opportunity of 1.8 million. Note that down. Now, I also  
19 have another shake in this. I actually live in this city.  
20 I live in district four, which means I'm very much in the  
21 zone and have the luxury of getting here on foot every  
22 day. The truth is I am an anomaly. That if anyone can  
23 find somebody to live here or to be that close, most of  
24 the time it's someone who is older or has been living here  
25 this long and gotten crazy.

1           The more I speak with people who live here in  
2 Berkeley, particularly in the last five years, the more  
3 I'm hearing they can't afford to live here. I know people  
4 from unrelated departments that live in Fairfield and  
5 Tracy. This is ridiculous. They have to get here driving  
6 in traffic and pick up children and do their shopping and  
7 some of them are not here; on behalf of my friends, can't  
8 be here. They have to pick up kids or have dinner and  
9 would get home at ten o'clock and have to get up again  
10 tomorrow. That's not healthy.

11           We're talking about creating space, technology,  
12 infrastructure -- whatever -- for people to excel in  
13 education, research, and public service. The thing is who  
14 is getting space and abandonment? When we remove parking  
15 spaces for people who basically don't have any other way  
16 of getting here, more and more people, even as time has  
17 gone by, have had a longer commute that can't live in the  
18 area and can't even live within the reasonable transit  
19 field.

20           How many buses would you have to take or how far  
21 would you have to drive to get to BART from Fairfield or  
22 Tracy? If you're driving from Tracy, you might as well  
23 keep going. This means when we perfectly remove spaces or  
24 temporarily remove them for a couple of years, this is 300  
25 or more people, their task of getting here is harder. It

PH2.8

1 makes it harder to be present in their work and frustrated  
2 having to get somewhere like six in the morning to find a  
3 parking space or endlessly circling the campus.

4 My husband works from home, and he sees already  
5 a number of people -- there is 2,000 spaces -- that can't  
6 find a parking space. Can't do it here or don't have  
7 enough money left on what they make to pay for the hunting  
8 license we call parking spaces. We need everybody here to  
9 be present and to be supportive to do their best work  
10 that, maybe, you don't see these people or know them. But  
11 there's just got to be some other way to allocate space  
12 down the road to make sure that all of these people are  
13 all submitted.

14 SUSAN WENGRAF: I'm going to try to stand over  
15 here so I address both you and the audience. Thank you  
16 for having the public hearing tonight and allowing me an  
17 opportunity to comment. My name is Susan Wengraf, and I'm  
18 currently your vice mayor for the City of Berkeley and  
19 city counsel representative of district six. The Goldman  
20 School of Public Policy sits within the boundary of  
21 district six and represents residents and businesses of  
22 that geographic area of the city.

23 The inclusion of the minor amendment to the 2020  
24 long-range development plan in the same DEIR as the upper  
25 Hearst development, the Goldman School project, is

PH 2.8

PH2.9

1 problematic. They are unrelated issues and should be  
2 studied and evaluated separately. The impact on the city  
3 of Berkeley's additional 11,285 students are dismissed in  
4 the DEIR and having no substantial impact. That is an  
5 assertion that cannot be substantiated, in light of the  
6 impact from the environment and services that the city  
7 provides to the U.C. campus students and affiliated  
8 community.

9           There was multiple defects of the 34 percent  
10 increase of U.C. Berkeley student relations: It decreases  
11 housing availability and increases rental costs and  
12 encourages debt inflation. It places greater demands on  
13 the city infrastructure, including water usage, sewer  
14 capacity, storm water contamination, etc. It increases  
15 demand on our emergency responders, including police and  
16 fire personnel. It exacerbates parking demand and traffic  
17 congestion.

18           Increasing the U.C. undergraduate population by  
19 34 percent does have significant impact on the City of  
20 Berkeley that must be analyzed and acknowledged. It is  
21 not a minor amendment, but instead warrants robust  
22 analysis in a separate study devoted solely to the impact  
23 of the increase of that number of students on U.C. campus  
24 on the City of Berkeley and larger Bay Area regions.

25           Regarding the Goldman School of Public Policy's

PH2.9

1 proposal for expansion, I'm supportive of the classroom  
2 and housing component. I have personally witnessed the  
3 overcrowding and lack of classroom space. The  
4 150-apartment units to be built over parking will fill the  
5 critical need for housing at the entry level of faculty  
6 and graduate students. The site for the project, the  
7 block that La Loma ... serves as a transition for the U.C.  
8 campus into a historic neighborhood and as such should be  
9 respectful of its massing in height.

PH2.10

10 For this reason, I support a four-story design  
11 for both the academic and housing proposals, in addition  
12 every effort should be made to direct vehicles using the  
13 parking garage away from and out of the adjacent  
14 residential neighborhood. However, more analysis is  
15 needed regarding the event space. The DEIR states that  
16 the large venue will be available for both public and  
17 private events for as many as four hundred fifty people  
18 during both day and nighttime.

19 Is there a need for such a large space? Was an  
20 analysis done that justifies the size of the event space?  
21 How will attendees get to the site? These questions are  
22 not addressed and it's impossible to comment on potential  
23 impacts without knowing the answers. My assumption is  
24 that this space will be used by the entire U.C. campus and  
25 will also be available for private rental. As currently

PH2.11



1 designed, the event space far exceeds the needs of the  
2 Goldman School enrollment.

3 Are the current event spaces on campus not  
4 sufficient for the current needs of the university?  
5 Again, where is the analysis to support an event space for  
6 up to four hundred and fifty people? The Goldman School  
7 project is a good one. Do not hold it hostage to the  
8 population increase in the minor amendment to the 2020  
9 long-range development plan. Let it move forward and  
10 remove the minor amendment in the upper Hearst development  
11 for the Goldman School of DEIR. Thank you.

12 MR. GIBSON: Thank you for everyone's patience.  
13 We want to hear comments and appreciate everyone keeping  
14 comments on time. And with that, Fred, I would like to  
15 thank you for giving away some of your time tonight.

16 FRED DODSWORTH: I want to thank council,  
17 personally. Mrs. Wengraf was very polite. She is a  
18 counselor person. I'm not polite. This project is a  
19 fraud. The University of California has increased their  
20 enrollment by eleven thousand people; nine thousand over  
21 their agreed-upon number in the 2020 plan. They have  
22 failed to provide the 2,500 units that they promised in  
23 the 2020 plan and yet we're here today listening to them  
24 ask, first, to negotiate good faith when they obviously  
25 and clearly are not operating in good faith.

PH2.11

PH2.12

1           How can we, as citizens of Berkeley, as  
2 taxpayers of California, trust that the university is not  
3 going to lie again? I get, because I'm a former employer  
4 and former alumni, letters from the endowment committees  
5 that say that there are \$400 million that they raise every  
6 year; why isn't that money going to house our students?

7           When the Hunt Brothers controlled the silver  
8 market in the '80s, they controlled us at 5 percent and  
9 yet your university has upheld over 10 percent of our  
10 total population and you're claiming there are no impacts?  
11 That's a lie. That's a point-blank lie. You ask for a  
12 respectful process. I ask for this process to  
13 be respected. It is not.

14           It's dishonest and I encourage the two counsel  
15 people to do as I told the major. It's time to sue the  
16 university and make them abide by their agreements.

17           NORAH FOSTER: I'm back. My name is Norah  
18 Foster and I've worked at the university for thirty-five  
19 years and retired from the library.

20           "People's Park. We will defend this place until  
21 the last drop of fear and the first drop of rain.

22           "People's Park, the wizards in old tales used to  
23 bury their hearts in secret places and unless you dug up a  
24 heart and destroyed it, they were invulnerable and  
25 heartless. Part of my heart is buried in People's Park.

PH2.13

PH2.14

1 Not all of it. Not even the largest part. Other places  
2 people -- and I'm no wizard, so I keep some of it  
3 myself -- part of my heart is buried in People's Park.  
4 Leave it alone.

5 "It is the part that will never be reasonable,  
6 never grow up and know better and do worse. It's young.  
7 Breathing is sweet to it and wild and scary. It remembers  
8 meeting soldiers' bandit with the daffodil. It remembers  
9 tear gas drifting over swing set. It will always be  
10 young. Leave it alone. I go to the park sometimes to  
11 talk to it. Not often. Time passes and it doesn't always  
12 recognize me, but it tells me that there are many hearts  
13 buried with it. All young and all proud of what they made  
14 and fought for. Do not disturb them. Do not build on  
15 them.

16 "Do not explain the times of change. Do not  
17 tell them for their own good. They've heard that before.  
18 They will not believe you. There are many parts buried in  
19 People's Park and parts of my own, as well. Oh, leave  
20 them alone. Leave the trees alone." Thank you.

21 To the counsel person, if they build up there  
22 could be more room. That's a whole redesign and a major  
23 headache for the designers. Thank you very much for  
24 letting me include that. I appreciate it. Thank you.

25 MR. GIBSON: Our next speaker is Martha Chavez.

PH2.14

1           MARTHA CHAVEZ: Good evening. My name is a  
2 Martha Chavez, and I'm the senior assistant dean for  
3 academic programs for the Goldman School and every day I  
4 have to address the lack of classroom space and student  
5 needs for space, as well as students' concerns for the  
6 lack of housing for Goldman School students, but also for  
7 faculty and staff that we are trying to recruit to a top  
8 public policy school.

9           So one of my many roles is to actually plan the  
10 teaching schedule, which includes planning and reserving  
11 classroom space, as well as reserving student space for  
12 collaborative teamwork and projects. We currently do not  
13 have space for all of our student and academic needs. The  
14 current 2607 Hearst Avenue building has a living room,  
15 which was mentioned earlier. And, in that living room,  
16 every day our students have to cram into this room and  
17 engage in doing work groups and have to work on teams and  
18 projects that are part of the core curriculum, which is  
19 why they come to the Goldman School, and they are often  
20 sitting in hallways trying to conduct client work groups  
21 with external partners at all levels of government and  
22 advocacy organizations and other major organizations.

23           They have to have meetings and have to have  
24 calls and have to work on assignments sometimes even on  
25 the floor in the living room, in addition our student

PH2.15

1 leadership club cannot find space to do any kind of  
2 planning or hold any kind of events because we don't have  
3 workspace nor do we have any kind of breakout space for  
4 our students. Furthermore, over half of our students are  
5 teaching assistants and have to hold office hours, review  
6 sessions, and tutoring sessions in the living room.  
7 Which, again, is crammed and often chaotic.

8 We also don't have any touchdown space for  
9 adjunct and lectures, who are important and critical to  
10 helping to meet the needs of all of our academic students  
11 in programs. We also have research centers with staff,  
12 who don't have space in the school to conduct their  
13 crucial research and program activities, and we often have  
14 to go across the campus because we just don't have enough  
15 space for Goldman School.

16 I want to underscore the fact that we're trying  
17 to recruit the top talent of students who want to make  
18 change in the world -- positive change -- and we  
19 desperately need classroom space to offer them the very  
20 best education, along with recruiting the best faculty as  
21 well. Thank you.

22 MR. GIBSON: Next up is Margot Smith.

23 (Discussion off the record.)

24 RIGEL ROBINSON: Good afternoon. I'm Rigel  
25 Robinson, Berkeley city council member. There are two

PH2.15

PH2.16

1 very very distinct conversations I want to talk about  
2 today. The first of which I'm very excited; I graduated a  
3 long time ago in May of 2008 with a minor in public policy  
4 and acutely aware of the housing crisis here and the need  
5 for more academic resources. The other conversation I  
6 want to bring up here, it seems to -- it strikes me as  
7 almost disingenuous. I'm really excited about this  
8 project and I'll thank you. We've been working  
9 intentionally on it and bring forward my deepest sympathy,  
10 so we'll be working day and night on the parking impact.  
11 There is a lot to be excited about.

PH2.16

12 What strikes me as strange suggests a big reason  
13 that we have the numbers that we do is because, as the  
14 campus is dramatically over enrolled in housing  
15 development, has not kept pace. Every single year it is  
16 disproportionately higher and the campus population exists  
17 and lives in the off-campus realm. And the population of  
18 nine thousand more students does have impact. It impacts  
19 on the campus and it impacts on the city. Discussion,  
20 which is one of the ways to look at it; but, also, I would  
21 encourage you to look at it as a project to the campus and  
22 how the enrollment growth impacts on the students here.

PH2.17

23 I would say for myself, when I attended U.C.  
24 Berkeley, defining the U.C. Berkeley student experience  
25 was the housing crisis. The fact that the supply for

1 housing was so dramatically out of scale with the demand.  
2 And we know that an additional nine thousand people is a  
3 beautiful thing. The state is growing and our public  
4 university should grow too, but we can't pretend that the  
5 draft of our EIR doesn't have impact. That means a strain  
6 on our emergency resources, and it means that students are  
7 fighting each other for housing and living further and  
8 further from campus and is not good for our environment,  
9 and we need to have that discussion in a more robust way.

10 And we need to have a discussion of the very  
11 important and very overdue project doesn't strike me as  
12 the cooperative way to make sure that we discuss the  
13 growth and best ways to mitigate it and make sure that the  
14 campus is really investing in the student care in the way  
15 that it should and also in the city and its parks. And we  
16 know this is to contribute to the campus. The enrollment  
17 growth is no blame of your own. And ... in numerous  
18 similar situations. U.C.L.A. and Santa Cruz have similar  
19 housing crises around their campus communities and this  
20 situation has become untenable.

21 We obviously want to meet the increase of demand  
22 across the state, but we can't continue working in good  
23 faith in our cities, if we are not able to invest in the  
24 students we're carrying and promising; and, so far, U.C.  
25 Berkeley has proven it can't do that. So I would ask to

PH2.17

1 move forward with both discussions. Thank you.

2 MR. GIBSON: Next we have Daniella Thompson.  
3 And next five in order will be Charles Pugh, Jim Sharp,  
4 Aidan Hill, Arturo Fernandez, and number fifteen is Tarek  
5 Zohdi.

6 DANIELLA THOMPSON: I already spoke last time,  
7 but I have more to say. We've heard Henry Brady and  
8 associates say to give us their need for space and I fully  
9 understand that; but, for some reason, the EIR does not  
10 analyze that need for space fully. And so all we have is  
11 this antidotal evidence. I still don't understand why  
12 this 27,000 square foot building has to have this glass  
13 bubble on top? Why a Bay view? It seems that the cost of  
14 such an extravagant building is what's driving the mammoth  
15 housing development nextdoor, because somebody has to pay  
16 for what looks to me a bit like hubris and doesn't need to  
17 be as fancy as proposed.

18 So I'll say again what I said before, I think a  
19 three-story academic building and four-story housing  
20 element would be a nice win-win situation for the  
21 university and community. And, of course, we would like  
22 to see a much better design than a very cold, insensitive  
23 building and be stuck with it. Thank you.

24 CHARLES PUGH: My name is Charles Pugh and I'm a  
25 professor in the math department. The math department and

PH2.18



1 its, more or less, hundred-or-so people are going to be  
2 majorly impacted by this project where the parking  
3 structure which we've used for many years will be  
4 demolished. It's interesting that the first I heard of  
5 this was on -- oh, about a couple of weeks ago -- my car  
6 was placed a green sheet which said the building would be  
7 demolished. The same night as the precursor of this  
8 meeting, I don't think that's a very transparent process,  
9 to say the least.

10 Another point: I have a letter e-mail from  
11 Professor Bokor in the, I guess, computer science  
12 department and some aspect -- electrical engineering and  
13 science. Different figures. I'm concerned about the  
14 parking. That's what I'm talking about. Different  
15 figures on his analysis. Different figures than just  
16 given; four hundred and seven reduced to something.  
17 Different figures from this letter that I got from this  
18 committee. That is not very reassuring.

19 I tend to worry that this is just a -- it's not  
20 a fraud exactly, but it is misrepresenting what is going  
21 on. The decisions have been made and we're just being put  
22 up with because there is, apparently, some regulations  
23 that say so. Parking is at issue on working for the  
24 university for hiring people. If they know what it's  
25 going to be like, they might -- they would -- think twice.

PH2.19

1 I noticed that there is this \$30,000 that the Goldman  
2 School was given ... eliminated. I haven't seen it; are  
3 they going to build new parking spaces? That would be  
4 nice.

PH2.19

5 But what I really object to is that maybe the  
6 environment has been considered but has a faculty? I  
7 don't notice that anywhere. I don't notice that the  
8 faculty has been poled or that it will be affected by  
9 this. Which, more or less, is the engineering faculty and  
10 math faculty. This is the first I've heard. Thank you.

11 MR. GIBSON: Next up Jim Sharp.

12 JIM SHARP: Good evening. I've been a long  
13 resident of the neighborhood and of the project. We were  
14 here nineteen years ago, when we watched the Goldman  
15 School double in its capacity, and this time it looks like  
16 they want to triple in capacity. I've heard other people  
17 say the word metastasis, but go figure. If I had to  
18 describe this project to somebody that didn't know  
19 anything about it, I would characterize it as a zombie  
20 vanity project. And it got started, at least, two years  
21 ago and has kind of been going on like that ever since.

PH2.20

22 In addition, it's backed by this aerial strip  
23 mine of housing nearby. Now, we all need housing. Right?  
24 This is a special kind. It's called, P3. It's an  
25 outsource form of housing. So it's got a Texas developer

1 and rainmaker from Alabama, and it's built on the edge of  
2 the special study zone, as well as yoked to the EIR  
3 changes. I can see lots of problems with this project.

4 One has to do with the transparency that we  
5 talked about. I noticed that the day after the last  
6 hearing down at U.C.L.A. there was a meeting of The  
7 Regents, and they received discussion Item No. 7 where the  
8 university present delivered to the members of the  
9 strategies committee, a whole bunch of -- well, seven --  
10 pages. I found it useful information that was not in the  
11 EIR that I saw previously. And it seemed, what looked  
12 like to me, like pretty flaky financing opportunities or  
13 suggestions.

14 The rainmaker would get a ground release to that  
15 site and I doubt there is anybody in this room that would  
16 be alive before the whole project gets repaid. In  
17 addition, on the parking issue, this morning I saw a paper  
18 attached to the signs outside the upper Hearst parking  
19 structure. They disappeared quickly. I'm wondering; is  
20 this the outreach? Some people said that they received  
21 the paper on their windshield.

22 What I'm wondering is it why Fehr & Peers  
23 Consultants has not dug a little deeper. Parking is an  
24 issue for the whole neighborhood. Those particularly of  
25 us that don't even have garages and so we have to deal

PH2.20

PH2.21

1 with the Greek concerts and other events that come up,  
2 including, as I imagine, Goldman events in the future.

3 Thank you. We should re-circulate the whole  
4 thing.

5 AIDAN HILL: Hello, everyone. My name is Aidan  
6 Hill. I chose to come to U.C. Berkeley in 2016, after  
7 transferring as a student to the university and college I  
8 applied to. It was an easy choice for me. My older  
9 sister is an alumni of this university, my nephew goes to  
10 Berkeley High School, and my mother's name is Ursula  
11 Endera (phonetic). As an undergraduate from a university  
12 pushing people of color into debt, I spent \$17,000 per  
13 semester I couldn't even complete through my  
14 hospitalization that stopped me from finishing my college  
15 education.

16 And I ran for Berkeley counsel, District 7, for  
17 the university and studying the university's history for  
18 months and still fighting to give me, as well as siblings,  
19 by public policy, to have the right to go back to school.  
20 During the conversations with the chancellor, a few months  
21 ago, it was mentioned that Berkeley's discovery and  
22 experience to connect and engage reflects a big part on  
23 the way U.C. Berkeley's students organize in experimental  
24 ways. The university wants to make it the centerpiece of  
25 the undergraduate experience; however, their action

1 against me and my friends in 2019 suggests otherwise.

2 Mind you, I am still a student discovering,  
3 engaging, and connecting to People's Park. The only  
4 secure place for frequent dwellers and only green space  
5 open to the community ... it threatens human genocide for  
6 the southside district. Reassess the project. It is  
7 absolutely essential that People's Park remain a green  
8 space and that all five points of the university and its  
9 strategic plans are present here. For example, future of  
10 democracy.

11 People's Park community encouraging users and  
12 developers, challenges around inequality and opportunity  
13 is primarily used by people of color and essentially a  
14 racist act. This is the only area ... food and clothing.  
15 We have community gardens dedicated to resilience and  
16 climate, as the southside is the only space that has a  
17 deep connection to artificial intelligence by preserving  
18 the science of life, the park serves as a digital gauge  
19 and totality of urban equality.

20 If the university had existed for 150 years, it  
21 showed us an enriched environment. People's Park was  
22 birthed out of a free-speech movement me and my community  
23 members love U.C. Berkeley with all of our hearts. I  
24 hope, as your golden bear, you will take this feedback  
25 seriously and realize how we truly are in this together.

PH2.22

1 People's Park has been blooming for 50 years, and we are  
2 still here and will be blooming for another 50 years.

3 ARTURO FERNANDEZ: I have been a Berkeley  
4 resident and U.C. Berkeley student for the last years and  
5 sponsor and ... going to graduate. Over the last decade,  
6 I've seen an increase of U.C. housing unavailable to the  
7 students, as well as the increase associated with the  
8 economic typhoon. This has apparently tied into my  
9 experience as a graduate student and incredibly difficult  
10 for me, as a long time Berkeley resident and Bay Area  
11 native -- I grew up in Berkeley, California -- to find  
12 affordable housing.

13 As a graduate student, I've not paid that much  
14 to get a graduate degree. And we have to make the most  
15 out of our limited budget. This is an even more difficult  
16 and stressful process for students who live outside of the  
17 Bay Area such as live in L.A. and especially our  
18 international students. And those first generation and  
19 documented socioeconomically and early on in graduate  
20 program, finance assembly I brought these issues to the  
21 administration and demand they create a plan for housing  
22 to more students and to be available to all students,  
23 specifically graduate students that have housing options  
24 available to them.

25 In general, I do believe that U.C. Berkeley

PH2.22

PH2.23

1 already provides the least amount of housing out of all of  
2 the U.C.'s and we are, unarguably, the best one. The  
3 number one university. Thank you for amending the  
4 project. My only point is that it's not enough. It can  
5 or should be taller, it doesn't do enough to provide  
6 affordable housing, and it doesn't do enough to provide  
7 academic space. And while I am truly sympathetic to the  
8 number of our community who drive in, I think we can keep  
9 parking as-is or, dare I say, less. It was determined  
10 through somebody's comment that we do have people  
11 commuting out of the Bay Area, from Tracy and Modesto, I'm  
12 not too concerned about that. I don't have concerns about  
13 that.

14 So whether it's a few trees or old buildings  
15 that the Bay Area is going to change, to accommodate the  
16 people who work and live here, this land is your land and  
17 this land is my land and this land is our land and it  
18 belongs to you and me, I think about it that way. You  
19 really have to come to a point of privilege to say that  
20 things must remain the same. And those who can't get an  
21 education and those that work here, can't live here or  
22 study here and can't live here and must be able to afford  
23 by landlords and that the city wants you and not others.

24 With this project we want to increase access to  
25 education, housing, and employment and no one here has the

1 right to deny this option and use to others. This is a  
2 project that can't help enough. Thank you.

3 MR. GIBSON: The next speaker up we have is  
4 Tarek Zohdi. And the next five speakers are Marcel Moran,  
5 Jacquelyn McCormick, Angie Chen, Eli Yablonovitch.

6 TAREK ZOHDİ: Tarek Zohdi, Professor of  
7 mechanical engineering and also the elected chair on the  
8 faculty and staff. I represent two hundred and fifty  
9 faculty, five thousand students, and several hundred of  
10 the staff members. We sent a collective letter to  
11 Chancellor Christ, Professor Paul Zotto, and several other  
12 of the higher administration. Many are in the audience  
13 right now.

14 Two days ago, I wouldn't call it an ultimatum --  
15 the senate has now taken up this issue as of yesterday and  
16 is now fully investigating and will give all of the  
17 details. The letters will be posted on the College of  
18 Engineering's Web site publicly so everyone can see,  
19 number one, the letters from our dean and letters from her  
20 directly to our Chancellor Grist. Our letter collectively  
21 with several departments, from mechanical engineering to  
22 biological engineering to computer science and so forth,  
23 electively from each department and collectively wrote a  
24 letter.

25 And we've also now made a public domain Web site

PH2.24



1 with petition and, within the last hour, have had two  
2 hundred signees. So I imagine by the end of next several  
3 days, we'll probably have several more hundred. In  
4 summary, we have asked for one easy requirement. We would  
5 like for upper administration to meet with the faculty and  
6 staff in open forum and not outside of business hours.  
7 During the day when everyone is here. Faculty and staff  
8 that commute and difficult to come here before March 30th  
9 and to have the scheduled meeting sometime in the  
10 beginning of April. And, of course, we have a deadline  
11 and ask there be some contingency plans, if the deadline  
12 is not met. Thank you.

13 MARCEL MORAN: My name is Marcel Moran. I am a  
14 Ph.D. student in the city and regional planning of U.C.  
15 Berkeley. I'm currently enrolled at Goldman this  
16 semester. The proposed upper Hearst project affects  
17 students, academic programs, and the city environment.  
18 U.C. Berkeley currently suffers from a severe lack of  
19 student academic housing which secures recruitment and  
20 attention. This could all be provided in a much needed  
21 addition on campus ...

22 In addition, the single largest contributor to  
23 California's clogged emissions is the transportation  
24 sector of 40 percent. The use of automobiles not only  
25 affect our our climate, but our circulating air quality,

PH2.24

PH2.25

1 which the engineering professors likely know. We can't  
2 take clean air for granted and cars worsen the air we  
3 breathe every day. As a student being compromised a  
4 parking space, nor do I feel entitled to one, the  
5 university should not hugely deduce or subsidize  
6 ownership, particularly when there are bike racks and  
7 walking trails and shuttle buses for free to the  
8 university affiliates.

9 Thank you.

10 JACQUELYN McCORMICK: Hi, everyone. I'm  
11 Jacqueline McCormick, I'm chief of staff for Mayor Jesse  
12 Arreguin. I apologize that he could not be here tonight.  
13 He has an executive committee meeting of ABAG. And, of  
14 course, he was not able to make the last meeting because it  
15 was during the night of a counsel meeting. He has pinned  
16 the following letter that was sent -- a copy was sent to  
17 the chancellor today -- to Mr. Breines and Capital  
18 Strategies Staff. And I will be reading it for him.

19 "Dear, Mr. Breines and Capital Strategies Staff:  
20 Thank you for the opportunity to comment on the DEIR for  
21 the above-referenced project. My comments will be limited  
22 to the reference of increased enrollment in the  
23 aforementioned.

24  
25 "Increase in campus headcount by 11,285 students

PH2.25

PH2.26

1 and its impacts were not studied under the 2020 LRDP and  
2 are, therefore, not 'consistent' to the project. The  
3 programmatic approach of the 2020 LRDP was done within the  
4 context that student population would grow by only 1,650  
5 students between 2001/02 academic year and stabilize at  
6 that number by 2010. Instead, the student population has  
7 increased by almost seven times over that studied in the  
8 2020 LRDP.

9 "Furthermore, the university stated that it  
10 would be constructing an additional 2,600 beds but to date  
11 has only built 1,119, including those at Blackwell Hall  
12 just completed at the beginning of the 2018/19 academic  
13 year. The effort to create a new population baseline in  
14 preparation for the next generation LRDP, within the  
15 context of this project, is inconsistent and should be  
16 severed.

17 "This DEIR states, incorrectly, that there have  
18 been no significant impacts as a result of the student  
19 population increase. However, this DEIR studied only the  
20 impact of the increased population within the campus  
21 environment. Housing for all of this population increase  
22 (and some studied in the 2020 LRDP - for whom housing was  
23 not developed) has had to be accommodated within the city  
24 environs and has impacted the city in very significant  
25 ways.

PH2.26

1 "The increased population has, within the City  
2 of Berkeley, contributed to the regional housing crisis  
3 and resulting homeless increase; impacted rental rates for  
4 Berkeley residents and students; increased water  
5 consumption, waste water, storm water contamination and  
6 solid waste; put pressure on public service resources by  
7 increasing the ratio of police to residents, contributed  
8 to device and laptop crime rate increases and ambulance  
9 transport demand; challenge Berkeley's climate action  
10 goals through the increase in GHG emissions and  
11 individuals' carbon footprint.

12 "These impacts have not studied as a part of  
13 this DEIR. It goes without saying that impacts, of such a  
14 significant increase in enrollment, do not evaporate when  
15 a student walks off campus, especially since they do not  
16 live there.

17 "Over the past two years, my office has  
18 developed an excellent relationship with the chancellor  
19 and have looked forward to the prospect of a true  
20 partnership between the city and the university.  
21 Attempting to include the impacts of a seven-fold increase  
22 in the student population, above that previously promised,  
23 in this project DEIR will be detrimental to our  
24 partnership moving forward.

25 "In respect for the future of this relationship

PH2.26

1 and our ability to create mutual plans in growth and  
2 prosperity for both the city and the university, please  
3 remove the population increase from the consideration of  
4 this project.

5 "Sincerely, Jesse Arreguin."

6 MR. GIBSON: Angie Chen.

7 ANGIE CHEN: Hi, everyone. My name is Angie  
8 Chen and I'm a student at U.C. Berkeley. I'm here to  
9 speak on a portion of the EIR that impacts U.C. Berkeley's  
10 nine thousand students more than outlined in LRDP. It's  
11 not a significant amount, and it's not a minor limit, but  
12 I believe the university needs to take responsibility for  
13 growth and needs more housing development near campus and  
14 needs to be affordable for low-income students.

15 Berkeley includes low population rate and  
16 affordable housing rates to the same identified and that's  
17 really problematic because I'm someone who has paid like  
18 three thousand here and triple. I think that's  
19 ridiculous. And also places pressure on the city services  
20 like public safety and emergency resources. I think that  
21 the issue is really important and I think it warrants a  
22 separate environmental impact report. And estimates for  
23 analysis of the university to invest in us.

24 We need the university ... basic needs,  
25 education, and overall student experience. Like to add

PH2.26

PH2.27

1 that we've submitted a letter to elected officials and I  
2 would like you to be aware of that, as well. Thank you.

3 MR. GIBSON: Eli Yablonovitch.

4 ELI YABLONOVITCH: Hi. I'm a professor of  
5 electrical engineering at the east department at U.C.  
6 Berkeley. I have many inventions that each of you use  
7 every day; for example, every solar panel you see has one  
8 of my inventions in it. Actually, there are many  
9 professors in my department who are even more brilliant  
10 and smarter than I am.

11 We have a problem here with regard to providing  
12 transportation to these professors. And the issue seems  
13 to be, Dean Brady, simply hasn't been enough money raised.  
14 I've heard that only ten million has been raised, and the  
15 first half of this project is going to tear down a parking  
16 structure that costs \$20 million to replace, which doesn't  
17 make any sense. The building may have started out with  
18 very low intention, but the finances just weren't there.

19 As a result of what's happened, is that the  
20 parking structure is being torn down to create market rate  
21 housing. This is not housing that any student can afford.  
22 It's just there because the finances don't work out. They  
23 brought in a developer from another state and none of that  
24 makes any sense. The goal is to make the Goldman School  
25 better. I'm in favor of that. I want space for graduate

↑  
PH2.27

PH2.28  
↓

1 students, but this is going to come at the expense of  
2 losing many of the faculty. They simply won't be able to  
3 be professors at Berkeley because they won't be able to  
4 get here. Their commute will be unacceptable and they'll  
5 go to other universities.

6 So I don't want to see the Goldman School be  
7 slightly improved at the expense of what known as the  
8 greatest asset, which is the school of engineering, which  
9 has created many of the wonders of the world that we all  
10 use. So I think that's it. Thank you.

11 MR. GIBSON: Scott McNally.

12 SCOTT McNALLY: I'm Scott McNally and have been  
13 a staff person at U.C. Berkeley for over thirty years and  
14 I've been part of the ultimate youth program by the  
15 university and don't have to park every day. I lived in  
16 Berkeley for several years early on, when I could afford  
17 the housing. There was rent control then. Content.

18 In any case, what I want to speak to is  
19 basically our academic condition. I support the Goldman  
20 School and their academic admission. We're happy to send  
21 over students to other areas of campus to do enrollments,  
22 which I think is a good problem to have. We're trying to  
23 solve that. But the quality of life is going to be  
24 severely impacted by the loss of parking. The results of  
25 which is in competition of our own academic admission to

PH2.28

PH2.29

1 retain and recruit faculty.

2 They have to be able to get to work. With the  
3 loss of up to two hundred parking spots, I do try to work  
4 on days that I need to. But the time it's going to take  
5 to find parking and all of the other staff and faculty and  
6 students who can't afford housing, it's more than updates  
7 the \$30,000 for parking spots. That over time is trivial.

8 Also, traffic has increased. We have 60-foot  
9 buses on daily roads. I ride a bicycle and have been  
10 knocked off the road twice. That bus goes around and  
11 that's an issue I have. That's my problem. But I do ride  
12 my bike to work. And for two years we're going to have  
13 construction. We'll have hundred and fifty contractors  
14 coming to this site that usually go up to Foothill to  
15 park. That's a great idea. But, guess what, that's where  
16 everybody else is going to be. Where are they going to  
17 park? Hundred and fifty guys on top. That's a big deal.

18 It's going to be hard to sell when faced with  
19 this challenge. I applaud the Goldman School's academic  
20 plan and program, but I stress that it's trivial next to  
21 parking and transportation that's going to affect the  
22 campus students. Thank you.

23 MR. GIBSON: Lesley Emmington.

24 MARGOT SMITH: Excuse me, you forgot me.

25 MR. GIBSON: What's your name?

PH2.29



1 MARGOT SMITH: Margot Smith.

2 MR. GIBSON: Margot, you gave up your time  
3 earlier for Rigel.

4 (Discussion off the record.)

5 MARGOT SMITH: My name is Margot Smith. I'm an  
6 alumni of the School of Public Health here at Berkeley,  
7 and I'm a resident of Berkeley. And what I would like to  
8 say is that the increase in population of eleven thousand  
9 students here at Berkeley, to U.C. Berkeley, which  
10 violates the agreement of the City of Berkeley, does not  
11 take into account the number of faculty and staff that  
12 service those eleven thousand people.

13 So you're not only talking eleven thousand  
14 people, but I would like to know how many professor and  
15 staff people are also increased in number, by that  
16 increase in population size. I feel very sympathetic  
17 about the Goldman School's needs for space but if the  
18 university were rational about its population size of  
19 students, they wouldn't be using up all the space and  
20 there would be more space for the Goldman School required  
21 to utilize for their program.

22 So my question to you is: Why are you violating  
23 all of these regulations and agreements with the City of  
24 Berkeley and not taking into consideration the whole  
25 environment of traffic, water, electricity, use of

PH2.30



1 resources, allocation of space on a more rational basis  
2 and just deciding that you're going to have eleven  
3 thousand more students and put up more buildings and not  
4 account for the faculty and additional faculty and staff  
5 that you're going to need and other resources? This does  
6 not seem like a rational program to me. Thank you very  
7 much.

8 MR. GIBSON: Lesley Emmington.

9 LESLEY EMMINGTON: Yesterday I was at the  
10 Bancroft Library on campus and I looked out over the  
11 campus and it's quite beautiful now with green shards and  
12 completed Hansen buildings and no problem. People claim  
13 about throwing whatever and jumping around and very  
14 relaxed and the city has problems. So the Goldman School  
15 is one issue, but there is another issue and I tried to  
16 address it in a letter. So while SEIR claims to be  
17 accountable for analysis regarding U.C.B.'s increased  
18 student enrollment, it actually seems apparent that the  
19 main objective of this SEIR is to pontificate full  
20 disclosure, discussion, and/or detailed information  
21 regarding U.C.B.'s increased and intention to increase its  
22 student enrollment since the 2020 LRDP.

23 Since pontification, big foul play. Indeed this  
24 SEIR ... about a proposed and massive and significant  
25 upper Hearst development project, including its proposal

PH2.30

PH2.31

1 to building sizable off-campus accommodations, academic  
2 and conference for auditory facility. This is off campus  
3 and not on campus, but within the city environs.  
4 Off-campus parking facility? Yes or no. It's compelling  
5 with what you've all said. And massive off-campus housing  
6 complex, but the public is left without detailed  
7 information and/or discussion about the scope of a  
8 so-called minor amendment to the 2020 LRDP; i.e., U.C.B.'s  
9 increased student enrollment and potential and very  
10 significant effects upon the community at large.

11 Finally, in summary, page 2 the complaints made  
12 to the rational of the U.C.B.'s entitlement for an  
13 increase in student enrollment might be simply to  
14 accommodate the proposed housing land on the project site;  
15 i.e., the upper Hearst development site. So this is two  
16 questions. So, in fact, how is this SEIR compliant with  
17 the California Environmental Quality Act, when its  
18 discussion of significant student enrollment is merely  
19 assumed and submerged within the discussion of the Goldman  
20 project -- the upper Hearst development project -- rather  
21 than acknowledging that a significant change of student  
22 enrollment has already occurred since the 2020 LRDP?

23 Second question. How compliant with CEQA that  
24 the citizens of Berkeley and the city's government  
25 altogether do not have a full and adequate environmental

PH2.31

PH2.32

1 review of U.C.B.'s increase and projected increase of  
2 student enrollment so as to understand, to question, and  
3 fully discuss within the context of a separate EIR all  
4 potential economic. And, as the major brought out, public  
5 works, commitment, operational and environmental impact.

6 MR. GIBSON: Raphael Villagracia.

7 RAPHAEL VILLAGRACIA: Hi. My name is Raphael  
8 Villagracia, and I'm a student at U.C. Berkeley. I want  
9 to say that I truly appreciate the development of the  
10 project, but I share advocating for separate analysis and  
11 discussion. According to the draft of admitting nine  
12 thousand more students ... no impact on environment  
13 re-exam standards to measure the impact of our faculty on  
14 city. University doesn't operate in a vacuum independent  
15 of the city.

16 Higher education is being made more successful  
17 and visibly impacted by the city, in terms of  
18 environmental capability and affordability and acknowledge  
19 shortcomings there. As a student of the university, we  
20 need to be more considerate for the space you occupy and  
21 properly accommodate for impact, especially when  
22 considering new long-term development goals. If the  
23 university wants to be a more responsible leader in  
24 Berkeley, they should accommodate with the city and  
25 significantly improve the lifestyles of both students and

PH2.32

PH2.33

1 long-term residents, but accommodate ... includes  
2 lighting, better emergency services, public transit; and,  
3 more importantly, student housing.

4 And although it is obvious that we can't  
5 guarantee all students a place to live that attend the  
6 university, we need to ensure we can accommodate incoming  
7 students of the City of Berkeley. Thank you.

8 MR. GIBSON: Andres Albanese.

9 ANDRES ALBANESE: Hi. My name is Andres  
10 Albanese. And my wife and I live one block from the  
11 construction, so this is going to concern us because it is  
12 going to block our view, which means fresh air and have  
13 all of the problems that you're saying about parking space  
14 is a problem. But I've been living there for twenty-five  
15 years and Berkeley is a nice place and the reason I work  
16 for the international computer science for seven years and  
17 we were to participate in projects with the university for  
18 many programs, and I know how difficult it is to find  
19 housing in this place. I know because it was difficult  
20 for one year or less.

21 What I learned in these twenty-five years, the  
22 Berkeley campus starts at Bancroft and lots of residential  
23 communities there on University. It's a high-crime area.  
24 And if you look at the map and statistics of Berkeley, the  
25 best area in terms of crime is south of Berkeley. So this

PH2.33

PH2.34

1 program with project doesn't address that. How is this  
2 going to impact the crime in the area? In the twenty-five  
3 years, our car was stolen from inside the building two  
4 times. My house was burglarized, but this is nothing  
5 regarding to the south area of campus.

6 Because I had several visitors that were not on  
7 the screen and there are many stories of that. Look at  
8 statistics on the Web site Berkeley crimes and you can see  
9 that. This is the light area. North of the campus is a  
10 light area, and the other high is blue dark area. So  
11 something that they've not seen in the study is how this  
12 project is going to impact the crime in our area where  
13 there is going to be high. North of Berkeley is  
14 residential area and a lot of people have decided to  
15 retire over there.

16 So this is my point. And I don't claim -- not  
17 only was I a student, but a professor and a researcher,  
18 but I don't blame the students for bringing the crime.  
19 But when my car was stolen, it was people from other  
20 countries. They come and dress like students, so we're  
21 going to be surrounded by higher density of population and  
22 more crime. What is this project doing? There is no  
23 consideration. There are trees and many things in the  
24 environment, but it's a crime area because we're retired.  
25 Lot of us are retired here and want to live here and we're

PH2.34

1 going to be target to this and I think the study should  
2 address -- the project should address -- the crime, as  
3 well. Thank you.

4 MR. GIBSON: Next up is Carol Stone.

5 CAROL STONE: Hello. My name is Carol Stone and  
6 I live in district four. My children went to the Berkeley  
7 public schools and both of them have degrees from U.C.  
8 Berkeley. And I want to address the issue of severing the  
9 student population from the rest of the program that you  
10 have. I remember in, approximately, 1990 the university  
11 was trying to increase the population.

12 I heard it indirectly from a friend's son, who  
13 had a 4.0 grade point average from Southern California and  
14 was brought up and led into the university through the  
15 adjunct program and they were -- he was -- given  
16 off-campus housing. He couldn't take a lab course, he  
17 couldn't live in the dormitory, but he was guaranteed  
18 placement the next semester as part of the university  
19 because there would be so many dropouts, and it struck me  
20 as odd. I understood that it was better utilization of  
21 the facilities to have students all year around.

22 But these students, the whole group of them -- I  
23 don't know how many -- were brought in in the fall and  
24 sort of made -- they were called the extension students,  
25 but they were essentially students in the population. I

↑ PH2.34

PH2.35  
↓

1 am absolutely astounded to find out that they have over  
2 nine thousand students in here now that exceeded the last  
3 plan by the university. The long-range development plan.  
4 We are about to have another long-range development plan,  
5 and I do not understand why the university violated what  
6 they said they would do, and I want to beg you and insist  
7 through our counsel people and citizens to please make  
8 your agreements binding and to please severe the number of  
9 students from the rest of the Goldman plan.

PH2.35

10 And one last thing about that is to -- well,  
11 make the plan for the next binding, as well. The thing I  
12 was going to say is to say that the number of students is  
13 for the whole Bay Area. And I totally agree that it is  
14 ingenuous and that the biggest impact is on Berkeley and  
15 goes in concentric circles to the East Bay. But you just  
16 picked the Bay Area, but why stop there? Why not follow  
17 the lead of their dean and send students through Berkeley  
18 and Bay Area and California and all of the states and  
19 country and the whole world. So why stop?

20 MR. GIBSON: Sarah Abdeslahian.

21 SARAH ABDESHAHIAN: Hi. I'm Sarah  
22 Abdeslahian and I'm a Berkeley student here. I serve as  
23 an ACC campus organizing director at the university to  
24 catch up with past, present, and future enrollment growth.  
25 I should say early on that there has been a real lack of

PH2.36



1 students involved in the project and I urge the department  
2 to outreach for this; nonetheless, I see three main places  
3 of improvement. Berkeley housing: Obviously, we've heard  
4 this time and time again that housing is a big issue that  
5 every Berkeley resident, student or non-student, faces in  
6 some way. It's absolutely absurd that the university does  
7 not offer housing for, at least, even first-year students.

PH2.36

8 The university is pushing students further and  
9 further from the university. It exacerbates looking for a  
10 location and leaving the students without housing. And  
11 the university, right now, is held more responsible for  
12 displacement caused by building more student housing close  
13 to the university and affordable to students. Also,  
14 rethink about the parking spots. Some students have no  
15 vehicles at all and encouraging folks to not use vehicles  
16 either.

PH2.37

17 We desperately need another ambulance,  
18 especially with the closure of Alta Bates. Lastly, it  
19 impacts properly caring for students and providing better  
20 transportation options and massive waste and emissions  
21 that comes with enrollment of the students. And while we,  
22 as students and advocates of the ACC, are pressuring the  
23 city for more housing and more funding, we also need the  
24 university to kind of help us out here and need the  
25 university to act faster to ensure that we properly meet

PH2.38

1 the needs of current students. Thank you.

2 MR. GIBSON: Chris Cullander.

3 CHRIS CULLANDER: Hi. My name is Chris  
4 Cullander. I took by B.S. and Ph.D. from U.C. Berkeley  
5 and I was facultied in one of the deans of students for  
6 U.C.S.F. for all of my career and had to often find ways  
7 to compromise between a fair variety of needs of the  
8 students, faculty, and staff. And, remember, I do not  
9 envy you or your job. I'm now retired and live in  
10 Berkeley, the same place that I lived as a student, four  
11 blocks from campus.

12 Two things: First of all, use of department  
13 transportation and U.S. census area of 2010 and definition  
14 of the urban area is 2,500. The California Code defines  
15 the Berkeley area as 10,000. In either case, an urban  
16 area is a developed area of ten thousand residents or more  
17 and in, what's called, the settlement hierarchy. Forgive  
18 me for imposing this on you, this analysis is  
19 corresponding to a mid-size town. So an increase in  
20 enrollment is like another mid-size town on top of the  
21 existing mid-size town. It is a bit much, I think.

PH2.39

22 There needs to be, as people pointed out before,  
23 accounting where city services are needed; in fact, the  
24 ambulances are provided by the city and not provided by  
25 U.C. Berkeley. Berkeley has the police department, which

1 is underfunded and understaffed, but it has no ambulances.  
2 The second thing is that I've walked around this corner of  
3 the campus where the development is to take place and did  
4 see the Architectural Heritage Association ... a number of  
5 landmark buildings and looked up and found out that they  
6 are not just landmarked by Berkeley, but some by the state  
7 and some are landmarked by the United States government.  
8 It's one of the most densely landmarked areas in Berkeley,  
9 in fact.

10 One of the other most densely landmarked areas  
11 is the campus of Berkeley, California. I think that it's  
12 disrespectful not to take this into account. Build in  
13 consonance with this, if you're going to put a building up  
14 there and support the scale of alternatives on number four  
15 on that basis and hope there will be consideration of ...  
16 (clapping.)

17 Thank you.

18 MR. ARVIN: I think that concludes our public  
19 comments. Seeing none, thank you for coming out and  
20 providing comments. As I mentioned before, we'll respond  
21 in writing to all comments received. You can also e-mail  
22 comments to us at [planning@berkeley.edu](mailto:planning@berkeley.edu) until the  
23 deadline, which has been extended to April 12th at 5 p.m.

24 Thank you. Good night.

25 (TIME NOTED: 8:10 P.M.)

PH2.40

REPORTER'S CERTIFICATE

I, SANDRA S. PETRITSCH, CSR No. 11684, Certified  
Shorthand Reporter, certify;

That the foregoing meeting was stenographically  
reported by me at the time and place therein set forth and  
were thereafter transcribed;

That the foregoing is a true and correct  
transcript of my shorthand notes so taken.

I further certify that I am not a relative or  
employee of any of the parties nor financially interested  
in the action.

I declare under penalty of perjury under the  
laws of California that the foregoing is true and correct.

Dated this 12th day of April, 2019.

  
SANDRA S. PETRITSCH, CSR No. 11684



| <b>A</b>                         |                                 |                                 |                                  |
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41:11<br/><b>2,000</b> 12:5<br/><b>2,500</b> 15:22 48:14<br/><b>2,600</b> 33:10<br/><b>20</b> 36:16<br/><b>2001/02</b> 33:5<br/><b>2002</b> 5:8 10:16<br/><b>2008</b> 20:3<br/><b>2010</b> 33:6 48:13<br/><b>2016</b> 26:6<br/><b>2018/19</b> 33:12<br/><b>2019</b> 1:12 3:1 27:1 50:16<br/><b>2020</b> 12:23 15:8,21,23<br/>33:1,3,8,22 40:22 41:8<br/>41:22<br/><b>21</b> 1:12 3:1<br/><b>2607</b> 18:14<br/><b>27,000</b> 22:12<br/><b>288-3376</b> 1:21</p> <hr/> <p><b>3</b></p> <p><b>3/12</b> 4:19<br/><b>30</b> 4:21<br/><b>30,000</b> 7:16 24:1 38:7<br/><b>300</b> 11:24<br/><b>30th</b> 31:8<br/><b>34</b> 13:9,19<br/><b>39</b> 3:21</p> <hr/> <p><b>4</b></p> <p><b>4.0</b> 45:13<br/><b>40</b> 31:24<br/><b>400</b> 16:5</p> <hr/> <p><b>5</b></p> <p><b>5</b> 16:8 49:23<br/><b>50</b> 28:1,2</p> <hr/> <p><b>6</b></p> <p><b>6:30</b> 3:1<br/><b>60-foot</b> 38:8</p> <hr/> <p><b>7</b></p> <p><b>7</b> 25:7 26:16</p> <hr/> <p><b>8</b></p> <p><b>8:10</b> 49:25<br/><b>800</b> 1:21<br/><b>80s</b> 16:8</p> |
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## **APPENDIX B**

### **TRANSPORTATION ASSESSMENT MEMO**



## MEMORANDUM

Date: April 26, 2019  
To: Jonathan Berlin, Rincon Consultants  
From: Huma Husain and Sam Tabibnia, Fehr & Peers  
Subject: **Upper Hearst Development – Transportation Assessment**

OK18-0253

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Fehr & Peers assessed the existing conditions and vehicle trip generation for the proposed Upper Hearst development in Berkeley, California (Proposed Project). Based on our assessment, an intersection impact analysis is not needed for the Proposed Project because the project would generate fewer vehicle trips than existing conditions during both the AM and PM peak hours.

This memorandum summarizes the project description, existing conditions, and trip generation estimates and driveway queuing for both project options.

### PROJECT DESCRIPTION

The Proposed Project is located at the northwest corner of the La Loma Avenue/Hearst Avenue intersection. The site is currently occupied by the Upper Hearst surface parking lot and the multi-level Upper Hearst parking structure providing a total of 407 parking spaces, which includes 357 standard parking spaces and 50 attendant spaces. The existing parking spaces can be accessed through driveways on Ridge Road and Hearst and La Loma Avenues.

The Proposed Project would provide a total of 172 parking spaces. The Project would therefore eliminate 235 existing parking spaces by demolishing the surface parking and removing a portion of the parking structure to construct up to 150 new graduate student and/or faculty/staff housing units (consisting of 225 bedrooms) and up to 37,000 square feet of academic building. It is assumed that the Project may not provide dedicated parking spaces for the project, but the retained parking facility would continue to provide parking for University of California, Berkeley parking permit holders and visitors. Automobile access to and from the parking structure would be provided through one driveway on La Loma Avenue about 100 feet



north of Hearst Avenue that allows both left-turns and right-turns when entering and right-turns only when exiting the garage.

## EXISTING CONDITIONS

### EXISTING ROADWAY NETWORK

The project site is bordered by the following local roadways described below.

#### LOCAL ROADWAYS

*Hearst Avenue* is a two-lane east-west minor arterial extending between the Eastshore Freeway in the west and Highland Place in the east. Directly adjacent to the project area, westbound Hearst Avenue has metered parallel vehicle and motorcycle parking, and eastbound Hearst Avenue has metered motorcycle parking with a right-turn pocket. Hearst Avenue borders the south side of the project site.

*La Loma Avenue/Gayley Road* is a two-lane north-south local street extending between the UC Berkeley campus in the south and Glendale La Loma Park in the north. Adjacent to the project site, both directions of La Loma have Residential Parking Permit (RPP) and two-hour parallel vehicle parking. La Loma Avenue borders the east side of the project site.

*Ridge Road* is a two-lane east-west local street extending between the Pacific School of Religion at Le Conte Avenue in the west and Highland Place in the east. Adjacent to the project site, both directions of Ridge Road have RPP and two-hour parallel vehicle parking. Ridge Road borders the north side of the project site.

*Le Roy Avenue* is a two-lane north-south local street extending between the UC Berkeley campus to the south and residential neighborhoods near the Berkeley Rose Garden to the north. Adjacent to the project site, northbound Le Roy has metered one-hour parallel parking, and southbound Le Roy has metered one-hour parallel parking with a third of the block dedicated to disabled parking.

### EXISTING TRANSIT AND SHUTTLE SERVICES

Transit service providers in the project vicinity include AC Transit, which provides local and Transbay bus service, and Bear Transit, which is UC Berkeley's shuttle system.



## AC TRANSIT

Local bus service in Berkeley is provided by AC Transit. The nearest bus stop to the project site is on eastbound Hearst Avenue just east of Le Roy Avenue, which is shared with UC Berkeley Bear Transit. This bus stop is served by Lines 52 and F and provides a bench and shelter. Line 52 operates in a clockwise loop around Campus Park and provides connections to University Village in Albany, North Berkeley BART, and Downtown Berkeley. Line F operates in a clockwise loop around the Campus Park and provides connections to Downtown Berkeley, Ashby BART, Emeryville, and Downtown San Francisco. **Table 1** summarizes the characteristics of the AC Transit Lines operating in the project area.

## UC BERKELEY BEAR TRANSIT

Bear Transit is UC Berkeley's shuttle system, serving the Campus Park and vicinity. The nearest bus stop to the project site is on eastbound Hearst Avenue just east of Le Roy Avenue, which is shared with AC Transit. This bus stop is served by the Perimeter Line, Central Campus, and Night Safety Shuttle. The Perimeter Line and the Night Safety Shuttle operate in a clockwise loop around Campus Park, and the Central Campus Line operates in a clockwise loop around the northern parts of the Campus Park and provides connections to Downtown Berkeley. **Table 1** summarizes the characteristics of the UC Berkeley BEAR Transit lines in the project area.



**TABLE 1 - TRANSIT ROUTES IN THE PROJECT AREA**

| Line                      | Route                                                | Nearest Stop                                       | Weekday                                 |                      | Weekend         |                      |
|---------------------------|------------------------------------------------------|----------------------------------------------------|-----------------------------------------|----------------------|-----------------|----------------------|
|                           |                                                      |                                                    | Hours                                   | Headway <sup>1</sup> | Hours           | Headway <sup>1</sup> |
| AC Transit Local Lines    |                                                      |                                                    |                                         |                      |                 |                      |
| 52                        | University Village to UC Campus                      | Eastbound Hearst Avenue just east of Le Roy Avenue | 6:00 AM–12:00 AM                        | 15 (20)              | 8:00 AM–8:30 PM | 20 (20)              |
| AC Transit Transbay Lines |                                                      |                                                    |                                         |                      |                 |                      |
| F                         | UC Campus to Transbay Terminal                       | Eastbound Hearst Avenue just east of Le Roy Avenue | 5:00 AM-1:30 AM                         | 30 (30)              | 5:00 AM-12:30AM | 30 (30)              |
| Bear Transit Lines        |                                                      |                                                    |                                         |                      |                 |                      |
| Perimeter                 | Clockwise loop around campus                         | Eastbound Hearst Avenue just east of Le Roy Avenue | 7:00 AM – 7:30 PM                       | 30 (30)              | N/A             | N/A                  |
| Central Campus            | Downtown Berkeley to UC Campus                       | Eastbound Hearst Avenue just east of Le Roy Avenue | 6:45 AM – 10:45 AM<br>4:15 PM – 7:15 PM | 20 (20)              | N/A             | N/A                  |
| Night Safety              | UC Campus to BART, Clark Kerr Campus, and residences | Eastbound Hearst Avenue just east of Le Roy Avenue | 7:30 PM – 3:00 AM                       | 15-30                | N/A             | N/A                  |

1. Headway is the frequency, or interval of time, between buses travelling in any given direction along a designated route: Peak Period Headway (Off-Peak Period Headway).

Source: AC Transit website; summarized by Fehr & Peers, 2019.

## EXISTING PEDESTRIAN AND BICYCLE CIRCULATION

Within the project study area, all roadways provide sidewalks on at least one side of the street and all intersections have marked crosswalks. The Hearst Avenue/Le Roy Avenue and Hearst Avenue/La Loma Avenue intersections are signalized with high-visibility ladder crosswalks on all approaches. The La Loma Avenue/Ridge Road and Le Roy Avenue/Ridge Road intersections are all-way stop-controlled intersections with standard (transverse lines) crosswalks.

Based on the City of Berkeley *Bicycle Master Plan* (May 2017), bicycle facilities can be classified into the following types:

- **Multi-Use Paths (Class I)** – These facilities provide completely separated, exclusive right-of-way for bicycling, walking, and other non-motorized uses.





- **Bicycle Lanes (Class II)** – These facilities are striped, preferential lanes for one-way bicycle travel on roadways. Some Class II bicycle lanes include striped buffers that add a few feet of separation between the bicycle lane and traffic lane or parking aisle. Caltrans requires a minimum of four feet of paved surface for Class II bikeways on roadways without gutters and five feet for roadways with gutters or adjacent to on-street parking.
- **Bicycle Routes (Class III)** – These facilities are signed bicycle routes where people riding bicycles share a travel lane with people driving motor vehicles. Because they are mixed-flow facilities, Class III bicycle routes are only appropriate for low-volume streets with slow travel speeds. Bicycle Boulevards are included in this classification.
- **Separated Bikeways (Class IV)** – These are separated and protected bikeways where a type of barrier, usually curbs, bollards, or parking isles, separate the bike lane from the vehicular flow of traffic. These are also known as cycle tracks.

Currently, bicyclists are allowed on all streets within the study area. Hearst Avenue is a Class III Bicycle Route on both directions of the street adjacent to the project site. There are no designated bicycle facilities on La Loma Avenue, Gayley Road, Ridge Road, and Le Roy Avenue. The 2017 *Bicycle Master Plan* proposes Class III Bicycle Routes along La Loma Avenue and Gayley Road within the project vicinity.

## EXISTING INTERSECTION OPERATIONS

Fehr & Peers collected weekday AM and PM peak period (7:00 to 9:00 AM and 4:00 to 6:00 PM) traffic counts, including counts of heavy vehicles, pedestrians and bicycles, at the Gayley Road/La Loma Avenue/Hearst Avenue intersection in April 2018, while UC Berkeley was in normal session. **Appendix A** presents the raw collected traffic data.

Based on the observed volumes, intersection control, and roadway configurations collected through field observations, Fehr & Peers calculated the AM and PM peak hour intersection level of service (LOS)<sup>1</sup> at the

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<sup>1</sup> The operations of roadway facilities are typically described with the term level of service (LOS), a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, which reflects free-flow conditions where there is very little interaction between vehicles, to LOS F, where the vehicle demand exceeds the capacity and high levels of vehicle delay result. LOS E represents at-capacity operations. When traffic volumes exceed the intersection capacity, stop-and-go conditions result and a vehicle may wait through multiple signal cycles before passing through the intersection; these operations are designated as LOS F.



Gayley intersection using the HCM 2010 methodology. **Table 2** summarizes the existing weekday AM and PM peak hour intersection LOS analysis results. **Appendix C** provides the detailed calculation work sheets. As shown in the table, the intersection operates at LOS B during both AM and PM peak hours.

**TABLE 2 - EXISTING WEEKDAY INTERSECTION LOS SUMMARY**

| Intersection                                | Control <sup>1</sup> | AM Peak Hour                 |     | PM Peak Hour                 |     |
|---------------------------------------------|----------------------|------------------------------|-----|------------------------------|-----|
|                                             |                      | Delay (Seconds) <sup>2</sup> | LOS | Delay (Seconds) <sup>2</sup> | LOS |
| 1. Gayley Road/La Loma Avenue/Hearst Avenue | Signalized           | 16                           | B   | 17                           | B   |

1. Average intersection delay and LOS based on the 2010 HCM method, unless noted. Average delay is reported for signalized intersections.

2. Estimated based on 2010 HCM delay thresholds.

Source: Fehr & Peers, 2019.

## PROJECT EVALUATION

### PROJECT TRIP GENERATION

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Vehicle trips were estimated for the peak one-hour period during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) commute periods when traffic volumes on the adjacent streets are highest. The trip generation for each project component is described below:

#### CAMPUS HOUSING

The Institute of Transportation Engineers (ITE) *Trip Generation Manual (10<sup>th</sup> Edition)* was used to estimate the trips generated by the residential component of the project. The ITE trip generation rates are based on national data, collected in both suburban and urban locations, including dense urban locations with higher rates of non-automobile travel. Trips generated by the housing units were estimated using the ITE rates for off-campus student apartments adjacent to campus (ITE code 225), which estimates the number of trips generated based on the number of bedrooms.



The housing component of the project is estimated to generate about 27 AM and 56 PM peak hour trips. This estimate is conservative in that the ITE data used to estimate trip generation is based on data collected at mostly urban sites that are more auto-dependent and provide more parking supply than the project setting. The estimate does not account for the constrained parking supply at or near the site. Considering that the project may not provide dedicated parking for residents and that on-street parking is generally at or near-capacity, it is likely that the project would generate fewer trips than estimated.

## ACADEMIC BUILDING

The trip generation for the academic building component of the project was estimated based on the methodology developed for the UC Berkeley 2020 Long Range Development Plan (LRDP) EIR and updated based on the results of the 2016-2017 commute survey of various population groups. UC Berkeley estimates that the new academic building would result in up to 30 net new graduate students and 30 net new faculty and staff.

The academic building component of the project is estimated to generate about eight AM and seven PM peak hour trips. This estimate is conservative in that it does not account for the constrained parking supply at or near the site and assumes that all those who wish to drive to the site would be able to drive and park in the project vicinity.

## PARKING STRUCTURE

Fehr & Peers collected peak period vehicle counts at the four existing parking driveways on Wednesday, April 17, 2019 (see **Appendix B**). These counts were used to develop an average trip generation rate per parking space for the AM and PM peak hours. Based on these rates, the demolition of the 235 parking spaces under the Proposed Project is estimated to reduce trip generation by 76 AM and 76 PM peak hour trips. Daily trips for the parking structure were estimated based on the observed trip generation rate per parking space in the 2020 LRDP EIR of about 2.6 daily trips per space.

## TRIP GENERATION SUMMARY

**Table 3** presents the trip generation estimates for the project. The Proposed Project is estimated to increase daily trip generation by about 150 trips, reduce peak hour trip generation by about 41 trips during the AM peak hour, and by 13 trips during the PM peak hour.



The reason that daily trips increase while peak hour trips decrease is due to the difference in the trip generation rate per space during the peak and off-peak hours. The trip generation rate per space is lower in the off-peak hours because most parking structure users enter and exit during the peak hours. Thus, the removal of parking would result in a relatively smaller decrease in daily trips than the decrease during peak hours.

Since the Proposed Project would reduce automobile trip generation during both the AM and PM peak hours, it would not deteriorate intersection operations in the project area during peak conditions. The increase in daily trips would not warrant an intersection analysis because the increase in trips would be added to the study intersection during off-peak hours, when overall intersection volumes are lower than during the peak hours. Additionally, the daily trips would be distributed across all off-peak hours, resulting in minimal additional trips per hour. Thus, no intersection impact analysis is necessary.

**TABLE 3 - PROJECT TRIP GENERATION**

| Land Use                       | Size         | Daily Trips | AM Peak Hour |     |       | PM Peak Hour |     |       |
|--------------------------------|--------------|-------------|--------------|-----|-------|--------------|-----|-------|
|                                |              |             | In           | Out | Total | In           | Out | Total |
| Campus Housing <sup>1</sup>    |              |             |              |     |       |              |     |       |
| Campus Housing                 | 225 Bedrooms | 710         | 11           | 16  | 27    | 28           | 28  | 56    |
| Academic Building              |              |             |              |     |       |              |     |       |
| Graduate Student <sup>2</sup>  | 30 Students  | 10          | 1            | 0   | 1     | 0            | 1   | 1     |
| Faculty and Staff <sup>3</sup> | 30 Persons   | 30          | 6            | 1   | 7     | 1            | 5   | 6     |
| Subtotal                       |              | 40          | 7            | 1   | 8     | 1            | 6   | 7     |
| Parking Structure <sup>4</sup> |              |             |              |     |       |              |     |       |
| Parking Structure              | -235 Spaces  | -600        | -70          | -6  | -76   | -11          | -65 | -76   |
| Net New Trips                  |              | 150         | -52          | 11  | -41   | 18           | -31 | -13   |

1. ITE *Trip Generation (10th Edition)* land use category 225 (off-campus student apartment) adjacent to campus setting:  
 Daily Rate: 3.15 trips per bedroom  
 AM Peak Hour Rate: 0.12 trips per bedroom (41% in, 59% out)  
 PM Peak Hour Rate: 0.25 trips per bedroom (50% in, 50% out)
2. Based on the UC Berkeley 2020 LRDP methodology and the travel modes from 2016-2017 survey data:  
 Daily Rate: 0.23 trips per student  
 AM Peak Hour Rate: 0.05 trips per student (91% in, 9% out)  
 PM Peak Hour Rate: 0.05 trips per student (12% in, 88% out)
3. Based on the UC Berkeley 2020 LRDP methodology and the travel modes from 2016-2017 survey data:  
 Daily Rate: 0.85 trips per faculty/staff  
 AM Peak Hour Rate: 0.20 trips per faculty/staff (91% in, 9% out)  
 PM Peak Hour Rate: 0.19 trips per faculty/staff (12% in, 88% out)
4. Based on peak period driveway counts at the existing Upper Hearst parking facilities:  
 Daily Rate: 2.6 trips per parking space  
 AM Peak Hour Rate: 0.32 trips per parking space (92% in, 8% out)



PM Peak Hour Rate: 0.32 trips per parking space (14% in, 86% out)  
Source: Fehr & Peers, 2019.

## QUEUEING ANALYSIS AND DRIVEWAY OPERATIONS

A queuing analysis was completed for the Gayley Road/La Loma Avenue/Hearst Avenue intersection and the adjacent garage driveway to assess the impact of the Proposed Project driveway on queuing. Queues were analyzed by modeling traffic operations at the Gayley Road/La Loma Avenue/Hearst Avenue intersection and the project driveway on La Loma Avenue using Synchro 10 software to estimate the 50th and 95th percentile queues during the AM and PM peak hours.<sup>2</sup> Driveway volumes were estimated by applying the existing average trip generation rate per space (summarized in the trip generation section above) to the proposed number of spaces under the Proposed Project and all trips were assigned to the single driveway. Queue reports are provided in **Appendix D**.

The Proposed Project would provide one driveway on La Loma Avenue approximately 100 feet north of the Gayley Road/La Loma Avenue/Hearst Avenue intersection. **Table 4** summarizes the 50th and 95th percentile queue lengths. Southbound 95th percentile queues at the Gayley Road/La Loma Avenue/Hearst Avenue intersection would result in a small queue spillback that blocks the upstream La Loma Avenue driveway during the AM and PM peak hours; however, these queues would generally clear within each signal cycle at the intersection and would be similar to current conditions. Peak hour queues would not spill back to the driveway during most of the peak hour and the spillback would only occur for a short period of time; therefore, the project driveway would not cause a significant queuing conflict.

Although the queue spillback on southbound La Loma Avenue is not considered a significant impact, the following recommendation is provided to minimize blockage of the garage driveway.

**Recommendation 1:** Provide “KEEP CLEAR” pavement markings on southbound La Loma Avenue at the garage driveway to minimize blockage of the driveway.

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<sup>2</sup> 50th percentile queue means that 50% of the time, the queue is below the values shown. The remaining 50% of the time, the queue is above that value. Similarly, 95th percentile queue means that 95% of the time, the queue is below the values shown and 5% of the time, the queue is above that value.



**TABLE 4 – PROJECT QUEUING SUMMARY**

| Movement                                 | Storage Length <sup>1</sup> | 50th Percentile Queue Length <sup>2</sup> |              | 95th Percentile Queue Length <sup>2</sup> |              |
|------------------------------------------|-----------------------------|-------------------------------------------|--------------|-------------------------------------------|--------------|
|                                          |                             | AM Peak Hour                              | PM Peak Hour | AM Peak Hour                              | PM Peak Hour |
| Gayley Road/La Loma Avenue/Hearst Avenue |                             |                                           |              |                                           |              |
| Southbound                               | 100 feet                    | 80 feet                                   | 60 feet      | 120 feet                                  | 100 feet     |
| La Loma Avenue Driveway                  |                             |                                           |              |                                           |              |
| Northbound                               | 100 feet                    | <20 feet                                  | <20 feet     | <20 feet                                  | <20 feet     |
| Southbound                               | 170 feet                    | <20 feet                                  | <20 feet     | <20 feet                                  | <20 feet     |

**Bold** indicated that 95th percentile queue would exceed the available storage.

1. Storage length is defined as the length in feet between the study intersection and the nearest adjacent intersection.
2. 50th and 95th percentile queues based on the Synchro 10 software.

Source: Fehr & Peers, 2019.

Please contact us with questions or comments.

**Attachments:**

Appendix A – Intersection Counts

Appendix B – Driveway Counts

Appendix C – Intersection LOS Calculations

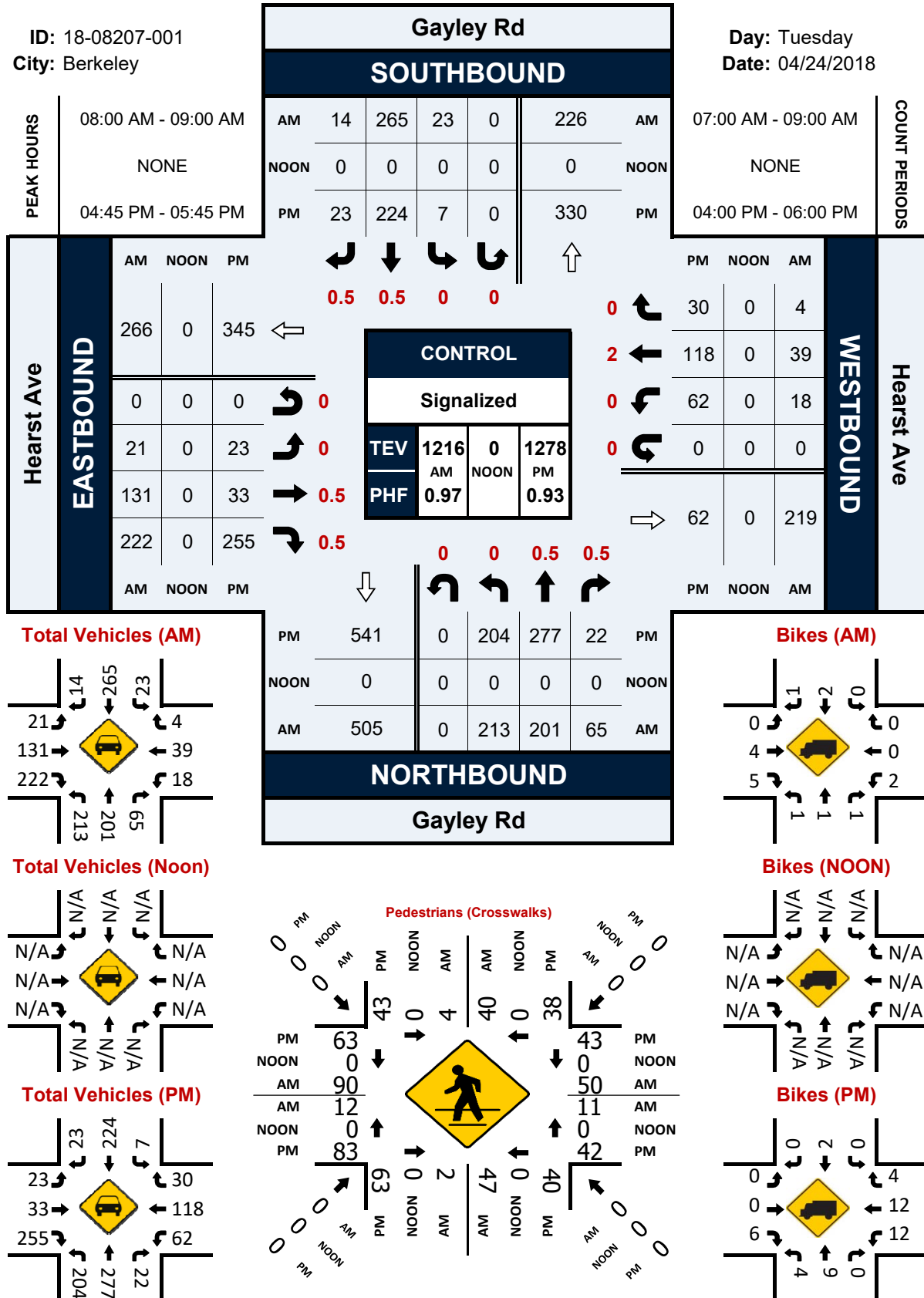
Appendix D – Intersection Queue Results

## Gayley Rd &amp; Hearst Ave

## Peak Hour Turning Movement Count

ID: 18-08207-001  
City: Berkeley

Day: Tuesday  
Date: 04/24/2018



# National Data & Surveying Services

## Intersection Turning Movement Count

Location: La Loma Ave & Garage Dwy 1

City: Berkeley

Control: No Control

Project ID: 19-08212-001

Date: 4/17/2019

### Total

| NS/EW Streets:   | La Loma Ave         |        |       |       | La Loma Ave |        |       |       | Garage Dwy 1 |       |        |       | Garage Dwy 1 |       |       |       |       |
|------------------|---------------------|--------|-------|-------|-------------|--------|-------|-------|--------------|-------|--------|-------|--------------|-------|-------|-------|-------|
| AM               | NORTHBOUND          |        |       |       | SOUTHBOUND  |        |       |       | EASTBOUND    |       |        |       | WESTBOUND    |       |       |       | TOTAL |
|                  | 0                   | 1      | 0     | 0     | 0           | 1      | 0     | 0     | 0            | 1     | 0      | 0     | 0            | 0     | 0     | 0     |       |
|                  | NL                  | NT     | NR    | NU    | SL          | ST     | SR    | SU    | EL           | ET    | ER     | EU    | WL           | WT    | WR    | WU    |       |
| 7:00 AM          | 0                   | 14     | 0     | 0     | 0           | 22     | 0     | 0     | 0            | 0     | 1      | 0     | 0            | 0     | 0     | 0     | 37    |
| 7:15 AM          | 2                   | 32     | 0     | 0     | 0           | 45     | 1     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 80    |
| 7:30 AM          | 1                   | 31     | 0     | 0     | 0           | 60     | 0     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 92    |
| 7:45 AM          | 2                   | 43     | 0     | 0     | 0           | 72     | 3     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 120   |
| 8:00 AM          | 1                   | 40     | 0     | 0     | 0           | 57     | 1     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 99    |
| 8:15 AM          | 4                   | 44     | 0     | 0     | 0           | 67     | 2     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 117   |
| 8:30 AM          | 8                   | 50     | 0     | 0     | 0           | 78     | 3     | 0     | 1            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 140   |
| 8:45 AM          | 3                   | 38     | 0     | 0     | 0           | 79     | 3     | 0     | 0            | 0     | 1      | 0     | 0            | 0     | 0     | 0     | 124   |
| TOTAL VOLUMES :  | NL                  | NT     | NR    | NU    | SL          | ST     | SR    | SU    | EL           | ET    | ER     | EU    | WL           | WT    | WR    | WU    | TOTAL |
| APPROACH %'s :   | 21                  | 292    | 0     | 0     | 0           | 480    | 13    | 0     | 1            | 0     | 2      | 0     | 0            | 0     | 0     | 0     | 809   |
|                  | 6.71%               | 93.29% | 0.00% | 0.00% | 0.00%       | 97.36% | 2.64% | 0.00% | 33.33%       | 0.00% | 66.67% | 0.00% | 0            | 0     | 0     | 0     |       |
| PEAK HR :        | 08:00 AM - 09:00 AM |        |       |       |             |        |       |       |              |       |        |       |              |       |       |       | TOTAL |
| PEAK HR VOL :    | 16                  | 172    | 0     | 0     | 0           | 281    | 9     | 0     | 1            | 0     | 1      | 0     | 0            | 0     | 0     | 0     | 480   |
| PEAK HR FACTOR : | 0.500               | 0.860  | 0.000 | 0.000 | 0.000       | 0.889  | 0.750 | 0.000 | 0.250        | 0.000 | 0.250  | 0.000 | 0.000        | 0.000 | 0.000 | 0.000 | 0.857 |
|                  | 0.810               |        |       |       | 0.884       |        |       |       | 0.500        |       |        |       |              |       |       |       |       |

| PM               | NORTHBOUND          |        |       |       | SOUTHBOUND |        |       |       | EASTBOUND |       |        |       | WESTBOUND |       |       |       | TOTAL |
|------------------|---------------------|--------|-------|-------|------------|--------|-------|-------|-----------|-------|--------|-------|-----------|-------|-------|-------|-------|
|                  | 0                   | 1      | 0     | 0     | 0          | 1      | 0     | 0     | 0         | 1     | 0      | 0     | 0         | 0     | 0     | 0     |       |
|                  | NL                  | NT     | NR    | NU    | SL         | ST     | SR    | SU    | EL        | ET    | ER     | EU    | WL        | WT    | WR    | WU    |       |
| 4:00 PM          | 1                   | 54     | 0     | 0     | 0          | 41     | 1     | 0     | 2         | 0     | 1      | 0     | 0         | 0     | 0     | 0     | 100   |
| 4:15 PM          | 0                   | 58     | 0     | 0     | 0          | 44     | 0     | 0     | 0         | 0     | 3      | 0     | 0         | 0     | 0     | 0     | 105   |
| 4:30 PM          | 0                   | 61     | 0     | 0     | 0          | 64     | 0     | 0     | 3         | 0     | 2      | 0     | 0         | 0     | 0     | 0     | 130   |
| 4:45 PM          | 0                   | 66     | 0     | 0     | 0          | 60     | 1     | 0     | 3         | 0     | 5      | 0     | 0         | 0     | 0     | 0     | 135   |
| 5:00 PM          | 0                   | 71     | 0     | 0     | 0          | 59     | 2     | 0     | 3         | 0     | 2      | 0     | 0         | 0     | 0     | 0     | 137   |
| 5:15 PM          | 0                   | 67     | 0     | 0     | 0          | 39     | 0     | 0     | 1         | 0     | 2      | 0     | 0         | 0     | 0     | 0     | 109   |
| 5:30 PM          | 0                   | 72     | 0     | 0     | 0          | 45     | 0     | 0     | 5         | 0     | 2      | 0     | 0         | 0     | 0     | 0     | 124   |
| 5:45 PM          | 1                   | 81     | 0     | 0     | 0          | 41     | 0     | 0     | 1         | 0     | 2      | 0     | 0         | 0     | 0     | 0     | 126   |
| TOTAL VOLUMES :  | NL                  | NT     | NR    | NU    | SL         | ST     | SR    | SU    | EL        | ET    | ER     | EU    | WL        | WT    | WR    | WU    | TOTAL |
| APPROACH %'s :   | 2                   | 530    | 0     | 0     | 0          | 393    | 4     | 0     | 18        | 0     | 19     | 0     | 0         | 0     | 0     | 0     | 966   |
|                  | 0.38%               | 99.62% | 0.00% | 0.00% | 0.00%      | 98.99% | 1.01% | 0.00% | 48.65%    | 0.00% | 51.35% | 0.00% | 0         | 0     | 0     | 0     |       |
| PEAK HR :        | 04:30 PM - 05:30 PM |        |       |       |            |        |       |       |           |       |        |       |           |       |       |       | TOTAL |
| PEAK HR VOL :    | 0                   | 265    | 0     | 0     | 0          | 222    | 3     | 0     | 10        | 0     | 11     | 0     | 0         | 0     | 0     | 0     | 511   |
| PEAK HR FACTOR : | 0.000               | 0.933  | 0.000 | 0.000 | 0.000      | 0.867  | 0.375 | 0.000 | 0.833     | 0.000 | 0.550  | 0.000 | 0.000     | 0.000 | 0.000 | 0.000 | 0.932 |
|                  | 0.933               |        |       |       | 0.879      |        |       |       | 0.656     |       |        |       |           |       |       |       |       |



# National Data & Surveying Services

## Intersection Turning Movement Count

Location: La Loma Ave & Garage Dwy 2

City: Berkeley

Control: No Control

Project ID: 19-08212-002

Date: 4/17/2019

### Total

| NS/EW Streets:   | La Loma Ave         |        |       |       | La Loma Ave |        |       |       | Garage Dwy 2 |       |        |       | Garage Dwy 2 |       |       |       |       |
|------------------|---------------------|--------|-------|-------|-------------|--------|-------|-------|--------------|-------|--------|-------|--------------|-------|-------|-------|-------|
| AM               | NORTHBOUND          |        |       |       | SOUTHBOUND  |        |       |       | EASTBOUND    |       |        |       | WESTBOUND    |       |       |       | TOTAL |
|                  | 0                   | 1      | 0     | 0     | 0           | 1      | 0     | 0     | 0            | 1     | 0      | 0     | 0            | 0     | 0     | 0     |       |
|                  | NL                  | NT     | NR    | NU    | SL          | ST     | SR    | SU    | EL           | ET    | ER     | EU    | WL           | WT    | WR    | WU    |       |
| 7:00 AM          | 5                   | 15     | 0     | 0     | 0           | 24     | 0     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 44    |
| 7:15 AM          | 3                   | 35     | 0     | 0     | 0           | 40     | 1     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 79    |
| 7:30 AM          | 7                   | 32     | 0     | 0     | 0           | 60     | 3     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 102   |
| 7:45 AM          | 4                   | 43     | 0     | 0     | 0           | 71     | 2     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 120   |
| 8:00 AM          | 3                   | 43     | 0     | 0     | 0           | 56     | 1     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 103   |
| 8:15 AM          | 5                   | 47     | 0     | 0     | 0           | 67     | 0     | 0     | 0            | 0     | 1      | 0     | 0            | 0     | 0     | 0     | 120   |
| 8:30 AM          | 1                   | 57     | 0     | 0     | 0           | 76     | 0     | 0     | 0            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 134   |
| 8:45 AM          | 5                   | 41     | 0     | 0     | 0           | 79     | 0     | 0     | 1            | 0     | 0      | 0     | 0            | 0     | 0     | 0     | 126   |
| TOTAL VOLUMES :  | NL                  | NT     | NR    | NU    | SL          | ST     | SR    | SU    | EL           | ET    | ER     | EU    | WL           | WT    | WR    | WU    | TOTAL |
| APPROACH %'s :   | 33                  | 313    | 0     | 0     | 0           | 473    | 7     | 0     | 1            | 0     | 1      | 0     | 0            | 0     | 0     | 0     | 828   |
|                  | 9.54%               | 90.46% | 0.00% | 0.00% | 0.00%       | 98.54% | 1.46% | 0.00% | 50.00%       | 0.00% | 50.00% | 0.00% | 0            | 0     | 0     | 0     |       |
| PEAK HR :        | 08:00 AM - 09:00 AM |        |       |       |             |        |       |       |              |       |        |       |              |       |       |       | TOTAL |
| PEAK HR VOL :    | 14                  | 188    | 0     | 0     | 0           | 278    | 1     | 0     | 1            | 0     | 1      | 0     | 0            | 0     | 0     | 0     | 483   |
| PEAK HR FACTOR : | 0.700               | 0.825  | 0.000 | 0.000 | 0.000       | 0.880  | 0.250 | 0.000 | 0.250        | 0.000 | 0.250  | 0.000 | 0.000        | 0.000 | 0.000 | 0.000 | 0.901 |
|                  | 0.871               |        |       |       | 0.883       |        |       |       | 0.500        |       |        |       |              |       |       |       |       |

| PM               | NORTHBOUND          |        |       |       | SOUTHBOUND |        |       |       | EASTBOUND |       |        |       | WESTBOUND |       |       |       | TOTAL |
|------------------|---------------------|--------|-------|-------|------------|--------|-------|-------|-----------|-------|--------|-------|-----------|-------|-------|-------|-------|
|                  | 0                   | 1      | 0     | 0     | 0          | 1      | 0     | 0     | 0         | 1     | 0      | 0     | 0         | 0     | 0     | 0     |       |
|                  | NL                  | NT     | NR    | NU    | SL         | ST     | SR    | SU    | EL        | ET    | ER     | EU    | WL        | WT    | WR    | WU    |       |
| 4:00 PM          | 2                   | 50     | 0     | 0     | 0          | 40     | 1     | 0     | 2         | 0     | 2      | 0     | 0         | 0     | 0     | 0     | 97    |
| 4:15 PM          | 1                   | 58     | 0     | 1     | 0          | 47     | 0     | 0     | 3         | 0     | 6      | 0     | 0         | 0     | 0     | 0     | 116   |
| 4:30 PM          | 0                   | 62     | 0     | 0     | 0          | 62     | 0     | 0     | 0         | 0     | 5      | 0     | 0         | 0     | 0     | 0     | 129   |
| 4:45 PM          | 2                   | 64     | 0     | 0     | 0          | 68     | 0     | 0     | 1         | 0     | 5      | 0     | 0         | 0     | 0     | 0     | 140   |
| 5:00 PM          | 1                   | 69     | 0     | 0     | 0          | 61     | 0     | 0     | 2         | 0     | 7      | 0     | 0         | 0     | 0     | 0     | 140   |
| 5:15 PM          | 2                   | 66     | 0     | 0     | 0          | 42     | 0     | 0     | 1         | 0     | 0      | 0     | 0         | 0     | 0     | 0     | 111   |
| 5:30 PM          | 0                   | 70     | 0     | 0     | 0          | 45     | 0     | 0     | 2         | 0     | 3      | 0     | 0         | 0     | 0     | 0     | 120   |
| 5:45 PM          | 0                   | 80     | 0     | 0     | 0          | 46     | 0     | 0     | 4         | 0     | 4      | 0     | 0         | 0     | 0     | 0     | 134   |
| TOTAL VOLUMES :  | NL                  | NT     | NR    | NU    | SL         | ST     | SR    | SU    | EL        | ET    | ER     | EU    | WL        | WT    | WR    | WU    | TOTAL |
| APPROACH %'s :   | 8                   | 519    | 0     | 1     | 0          | 411    | 1     | 0     | 15        | 0     | 32     | 0     | 0         | 0     | 0     | 0     | 987   |
|                  | 1.52%               | 98.30% | 0.00% | 0.19% | 0.00%      | 99.76% | 0.24% | 0.00% | 31.91%    | 0.00% | 68.09% | 0.00% | 0         | 0     | 0     | 0     |       |
| PEAK HR :        | 04:15 PM - 05:15 PM |        |       |       |            |        |       |       |           |       |        |       |           |       |       |       | TOTAL |
| PEAK HR VOL :    | 4                   | 253    | 0     | 1     | 0          | 238    | 0     | 0     | 6         | 0     | 23     | 0     | 0         | 0     | 0     | 0     | 525   |
| PEAK HR FACTOR : | 0.500               | 0.917  | 0.000 | 0.250 | 0.000      | 0.875  | 0.000 | 0.000 | 0.500     | 0.000 | 0.821  | 0.000 | 0.000     | 0.000 | 0.000 | 0.000 | 0.938 |
|                  | 0.921               |        |       |       | 0.875      |        |       |       | 0.806     |       |        |       |           |       |       |       |       |



**Location:** Parking Lot Dwy & Ridge Rd  
**City:** Berkeley  
**Control:** No Control

**Total**




















| NS/ EW Streets:  |            | Parking Lot Dwy     |       |        |       |            | Parking Lot Dwy |       |       |       |           | Ridge Rd |       |       |       |           | Ridge Rd |       |       |       |             | NORTHBOUND2 |       |       |       |       |       |       |       |
|------------------|------------|---------------------|-------|--------|-------|------------|-----------------|-------|-------|-------|-----------|----------|-------|-------|-------|-----------|----------|-------|-------|-------|-------------|-------------|-------|-------|-------|-------|-------|-------|-------|
| AM               | NORTHBOUND |                     |       |        |       | SOUTHBOUND |                 |       |       |       | EASTBOUND |          |       |       |       | WESTBOUND |          |       |       |       | NORTHBOUND2 |             |       |       |       |       |       |       |       |
|                  | 0          | 0                   | 0     | 0      | 0     | 0          | 1               | 0     | 0     | 0     | 0         | 1        | 0     | 0     | 0     | 0         | 1        | 0     | 0     | 0     | 0           | 0           | 0     | 0     | 0     | 0     | 0     | 0     | TOTAL |
|                  | NL         | NT                  | NR    | NU     | NU2   | SL         | ST              | SR    | SU    | ST2   | EL        | ET       | ER    | EU    | ER2   | WL        | WT       | WR    | WU    | WL2   | N2U         | N2L2        | N2T2  | N2R2  | N2U2  |       |       |       |       |
|                  | 7:00 AM    | 0                   | 0     | 0      | 0     | 0          | 0               | 0     | 0     | 0     | 0         | 9        | 2     | 0     | 1     | 3         | 5        | 0     | 0     | 0     | 0           | 0           | 0     | 0     | 0     | 0     | 0     | 0     | 20    |
|                  | 7:15 AM    | 0                   | 0     | 0      | 0     | 0          | 0               | 0     | 0     | 0     | 0         | 21       | 2     | 0     | 1     | 2         | 8        | 0     | 0     | 0     | 0           | 0           | 0     | 0     | 0     | 0     | 0     | 0     | 34    |
|                  | 7:30 AM    | 0                   | 0     | 1      | 0     | 0          | 0               | 0     | 0     | 0     | 0         | 15       | 7     | 0     | 0     | 4         | 12       | 0     | 0     | 1     | 0           | 0           | 0     | 0     | 0     | 0     | 0     | 0     | 40    |
|                  | 7:45 AM    | 0                   | 0     | 0      | 0     | 0          | 0               | 0     | 0     | 0     | 0         | 24       | 4     | 0     | 3     | 6         | 8        | 0     | 0     | 1     | 0           | 0           | 0     | 0     | 0     | 0     | 0     | 0     | 46    |
|                  | 8:00 AM    | 0                   | 0     | 0      | 0     | 0          | 0               | 0     | 0     | 0     | 0         | 20       | 6     | 0     | 4     | 3         | 8        | 0     | 0     | 1     | 0           | 0           | 0     | 0     | 0     | 0     | 0     | 0     | 42    |
|                  | 8:15 AM    | 2                   | 0     | 0      | 0     | 0          | 0               | 0     | 0     | 0     | 0         | 22       | 11    | 0     | 2     | 8         | 10       | 0     | 0     | 3     | 0           | 0           | 0     | 0     | 0     | 0     | 1     | 59    |       |
| 8:30 AM          | 0          | 0                   | 0     | 0      | 0     | 0          | 0               | 0     | 0     | 0     | 32        | 11       | 0     | 3     | 8     | 11        | 0        | 0     | 0     | 0     | 0           | 0           | 0     | 1     | 0     | 1     | 66    |       |       |
| 8:45 AM          | 0          | 0                   | 0     | 0      | 1     | 0          | 0               | 0     | 0     | 0     | 0         | 30       | 4     | 0     | 3     | 6         | 7        | 0     | 1     | 0     | 0           | 2           | 0     | 0     | 0     | 0     | 0     | 54    |       |
| TOTAL VOLUMES :  |            | NL                  | NT    | NR     | NU    | NU2        | SL              | ST    | SR    | SU    | ST2       | EL       | ET    | ER    | EU    | ER2       | WL       | WT    | WR    | WU    | WL2         | N2U         | N2L2  | N2T2  | N2R2  | N2U2  |       |       | TOTAL |
| APPROACH %'s :   |            | 50.00%              | 0.00% | 25.00% | 0.00% | 25.00%     | 0               | 0     | 0     | 0     | 0         | 0        | 173   | 47    | 0     | 17        | 40       | 69    | 0     | 1     | 6           | 0           | 2     | 0     | 0     | 1     | 1     | 1     | 361   |
| PEAK HR :        |            | 08:00 AM - 09:00 AM |       |        |       |            |                 |       |       |       |           |          |       |       |       |           |          |       |       |       |             |             |       |       |       |       | TOTAL |       |       |
| PEAK HR VOL :    |            | 2                   | 0     | 0      | 0     | 1          | 0               | 0     | 0     | 0     | 0         | 0        | 104   | 32    | 0     | 12        | 25       | 36    | 0     | 1     | 4           | 0           | 2     | 0     | 0     | 1     | 1     | 1     | 221   |
| PEAK HR FACTOR : |            | 0.250               | 0.000 | 0.000  | 0.000 | 0.250      | 0.000           | 0.000 | 0.000 | 0.000 | 0.000     | 0.000    | 0.813 | 0.727 | 0.000 | 0.750     | 0.781    | 0.818 | 0.000 | 0.250 | 0.333       | 0.000       | 0.250 | 0.000 | 0.500 | 0.250 | 0.250 | 0.837 |       |

| PM               |            | NORTHBOUND          |       |        |       |            | SOUTHBOUND |       |       |       |           | EASTBOUND |       |       |       |           | WESTBOUND |       |       |       |             | NORTHBOUND2 |       |       |       |       |       |       |       |
|------------------|------------|---------------------|-------|--------|-------|------------|------------|-------|-------|-------|-----------|-----------|-------|-------|-------|-----------|-----------|-------|-------|-------|-------------|-------------|-------|-------|-------|-------|-------|-------|-------|
|                  | NORTHBOUND |                     |       |        |       | SOUTHBOUND |            |       |       |       | EASTBOUND |           |       |       |       | WESTBOUND |           |       |       |       | NORTHBOUND2 |             |       |       |       |       |       |       |       |
|                  | 0          | 0                   | 0     | 0      | 0     | 0          | 1          | 0     | 0     | 0     | 0         | 1         | 0     | 0     | 0     | 0         | 1         | 0     | 0     | 0     | 0           | 0           | 0     | 0     | 0     | 0     | 0     | TOTAL |       |
|                  | NL         | NT                  | NR    | NU     | NU2   | SL         | ST         | SR    | SU    | ST2   | EL        | ET        | ER    | EU    | ER2   | WL        | WT        | WR    | WU    | WL2   | N2U         | N2L2        | N2T2  | N2R2  | N2U2  |       |       |       |       |
|                  | 4:00 PM    | 3                   | 0     | 2      | 0     | 0          | 0          | 0     | 0     | 0     | 0         | 26        | 0     | 0     | 0     | 0         | 20        | 0     | 0     | 0     | 1           | 0           | 0     | 0     | 0     | 0     | 0     | 52    |       |
|                  | 4:15 PM    | 1                   | 0     | 1      | 0     | 0          | 0          | 0     | 0     | 0     | 0         | 20        | 0     | 0     | 1     | 0         | 14        | 0     | 0     | 0     | 0           | 0           | 1     | 0     | 3     | 0     | 41    |       |       |
|                  | 4:30 PM    | 7                   | 0     | 2      | 0     | 0          | 0          | 0     | 0     | 0     | 0         | 35        | 0     | 0     | 0     | 1         | 21        | 0     | 0     | 0     | 0           | 1           | 0     | 0     | 0     | 0     | 67    |       |       |
|                  | 4:45 PM    | 5                   | 0     | 2      | 0     | 0          | 0          | 0     | 0     | 0     | 0         | 27        | 0     | 0     | 0     | 0         | 11        | 0     | 0     | 0     | 0           | 3           | 0     | 1     | 0     | 49    |       |       |       |
|                  | 5:00 PM    | 6                   | 0     | 3      | 0     | 0          | 0          | 0     | 0     | 0     | 0         | 27        | 1     | 0     | 1     | 0         | 28        | 0     | 0     | 0     | 0           | 2           | 0     | 1     | 0     | 72    |       |       |       |
|                  | 5:15 PM    | 10                  | 0     | 3      | 0     | 0          | 0          | 0     | 0     | 0     | 0         | 22        | 0     | 0     | 0     | 1         | 22        | 0     | 0     | 0     | 0           | 2           | 0     | 1     | 0     | 60    |       |       |       |
| 5:30 PM          | 5          | 0                   | 2     | 0      | 0     | 0          | 0          | 0     | 0     | 0     | 24        | 0         | 1     | 0     | 0     | 10        | 0         | 0     | 0     | 0     | 2           | 0           | 2     | 0     | 44    |       |       |       |       |
| 5:45 PM          | 4          | 0                   | 0     | 0      | 0     | 0          | 0          | 0     | 0     | 0     | 23        | 2         | 0     | 0     | 0     | 26        | 0         | 0     | 0     | 0     | 0           | 0           | 0     | 0     | 0     | 55    |       |       |       |
| TOTAL VOLUMES :  |            | NL                  | NT    | NR     | NU    | NU2        | SL         | ST    | SR    | SU    | ST2       | EL        | ET    | ER    | EU    | ER2       | WL        | WT    | WR    | WU    | WL2         | N2U         | N2L2  | N2T2  | N2R2  | N2U2  |       |       | TOTAL |
| APPROACH %'s :   |            | 69.49%              | 0.00% | 30.51% | 0.00% | 0.00%      | 0          | 0     | 0     | 0     | 0         | 0         | 204   | 3     | 1     | 2         | 2         | 152   | 0     | 0     | 1           | 0           | 9     | 0     | 7     | 0     | 440   |       |       |
| PEAK HR :        |            | 04:30 PM - 05:30 PM |       |        |       |            |            |       |       |       |           |           |       |       |       |           |           |       |       |       |             |             |       |       |       |       | TOTAL |       |       |
| PEAK HR VOL :    |            | 28                  | 0     | 13     | 0     | 0          | 0          | 0     | 0     | 0     | 0         | 0         | 111   | 1     | 0     | 1         | 2         | 82    | 0     | 0     | 0           | 0           | 8     | 0     | 2     | 0     | 248   |       |       |
| PEAK HR FACTOR : |            | 0.700               | 0.000 | 0.542  | 0.000 | 0.000      | 0.000      | 0.000 | 0.000 | 0.000 | 0.000     | 0.793     | 0.250 | 0.000 | 0.250 | 0.500     | 0.732     | 0.000 | 0.000 | 0.000 | 0.000       | 0.667       | 0.000 | 0.625 | 0.500 | 0.000 | 0.861 |       |       |

# HCM 2010 Signalized Intersection Summary

## 1: Gayley Road/La Loma Avenue & Hearst Avenue




















08/27/2018





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|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |                                                                                    |  |  |                                                                                     |  |                                                                                     |
| Traffic Volume (veh/h)       | 21                                                                                | 131                                                                               | 222                                                                               | 18                                                                                | 39                                                                                | 4                                                                                 | 213                                                                                | 201                                                                                 | 65                                                                                  | 23                                                                                  | 265                                                                                 | 14                                                                                  |
| Future Volume (veh/h)        | 21                                                                                | 131                                                                               | 222                                                                               | 18                                                                                | 39                                                                                | 4                                                                                 | 213                                                                                | 201                                                                                 | 65                                                                                  | 23                                                                                  | 265                                                                                 | 14                                                                                  |
| Number                       | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 7                                                                                  | 4                                                                                   | 14                                                                                  | 3                                                                                   | 8                                                                                   | 18                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.93                                                                              |                                                                                   | 0.90                                                                              | 0.96                                                                              |                                                                                   | 0.92                                                                              | 0.96                                                                               |                                                                                     | 1.00                                                                                | 0.98                                                                                |                                                                                     | 0.89                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1976                                                                                | 1976                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 22                                                                                | 135                                                                               | 229                                                                               | 19                                                                                | 40                                                                                | 4                                                                                 | 220                                                                                | 207                                                                                 | 0                                                                                   | 24                                                                                  | 273                                                                                 | 14                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                  | 1                                                                                   | 1                                                                                   | 0                                                                                   | 1                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                               | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %         | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Cap, veh/h                   | 98                                                                                | 537                                                                               | 464                                                                               | 346                                                                               | 537                                                                               | 54                                                                                | 475                                                                                | 405                                                                                 | 955                                                                                 | 92                                                                                  | 948                                                                                 | 47                                                                                  |
| Arrive On Green              | 0.32                                                                              | 0.32                                                                              | 0.32                                                                              | 0.32                                                                              | 0.32                                                                              | 0.32                                                                              | 0.57                                                                               | 0.57                                                                                | 0.00                                                                                | 0.57                                                                                | 0.57                                                                                | 0.57                                                                                |
| Sat Flow, veh/h              | 147                                                                               | 1683                                                                              | 1454                                                                              | 994                                                                               | 1685                                                                              | 169                                                                               | 715                                                                                | 712                                                                                 | 1680                                                                                | 77                                                                                  | 1666                                                                                | 82                                                                                  |
| Grp Volume(v), veh/h         | 157                                                                               | 0                                                                                 | 229                                                                               | 19                                                                                | 0                                                                                 | 44                                                                                | 427                                                                                | 0                                                                                   | 0                                                                                   | 311                                                                                 | 0                                                                                   | 0                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1830                                                                              | 0                                                                                 | 1454                                                                              | 994                                                                               | 0                                                                                 | 1854                                                                              | 1426                                                                               | 0                                                                                   | 1680                                                                                | 1825                                                                                | 0                                                                                   | 0                                                                                   |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 10.2                                                                              | 1.2                                                                               | 0.0                                                                               | 1.3                                                                               | 7.3                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 4.9                                                                               | 0.0                                                                               | 10.2                                                                              | 6.1                                                                               | 0.0                                                                               | 1.3                                                                               | 14.2                                                                               | 0.0                                                                                 | 0.0                                                                                 | 6.9                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.14                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.09                                                                              | 0.52                                                                               |                                                                                     | 1.00                                                                                | 0.08                                                                                |                                                                                     | 0.05                                                                                |
| Lane Grp Cap(c), veh/h       | 635                                                                               | 0                                                                                 | 464                                                                               | 346                                                                               | 0                                                                                 | 591                                                                               | 879                                                                                | 0                                                                                   | 955                                                                                 | 1087                                                                                | 0                                                                                   | 0                                                                                   |
| V/C Ratio(X)                 | 0.25                                                                              | 0.00                                                                              | 0.49                                                                              | 0.05                                                                              | 0.00                                                                              | 0.07                                                                              | 0.49                                                                               | 0.00                                                                                | 0.00                                                                                | 0.29                                                                                | 0.00                                                                                | 0.00                                                                                |
| Avail Cap(c_a), veh/h        | 635                                                                               | 0                                                                                 | 464                                                                               | 346                                                                               | 0                                                                                 | 591                                                                               | 879                                                                                | 0                                                                                   | 955                                                                                 | 1087                                                                                | 0                                                                                   | 0                                                                                   |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 0.00                                                                                | 0.00                                                                                | 1.00                                                                                | 0.00                                                                                | 0.00                                                                                |
| Uniform Delay (d), s/veh     | 20.2                                                                              | 0.0                                                                               | 22.0                                                                              | 22.5                                                                              | 0.0                                                                               | 19.0                                                                              | 10.4                                                                               | 0.0                                                                                 | 0.0                                                                                 | 8.9                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.9                                                                               | 0.0                                                                               | 3.7                                                                               | 0.3                                                                               | 0.0                                                                               | 0.2                                                                               | 1.9                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.7                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.7                                                                               | 0.0                                                                               | 4.6                                                                               | 0.3                                                                               | 0.0                                                                               | 0.7                                                                               | 6.2                                                                                | 0.0                                                                                 | 0.0                                                                                 | 3.7                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| LnGrp Delay(d),s/veh         | 21.2                                                                              | 0.0                                                                               | 25.8                                                                              | 22.8                                                                              | 0.0                                                                               | 19.3                                                                              | 12.3                                                                               | 0.0                                                                                 | 0.0                                                                                 | 9.6                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | B                                                                                  |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Approach Vol, veh/h          |                                                                                   | 386                                                                               |                                                                                   |                                                                                   | 63                                                                                |                                                                                   |                                                                                    | 427                                                                                 |                                                                                     |                                                                                     | 311                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 23.9                                                                              |                                                                                   |                                                                                   | 20.3                                                                              |                                                                                   |                                                                                    | 12.3                                                                                |                                                                                     |                                                                                     | 9.6                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 |                                                                                   | 2                                                                                 |                                                                                   | 4                                                                                 |                                                                                   | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     |                                                                                   | 30.0                                                                              |                                                                                   | 50.0                                                                              |                                                                                   | 30.0                                                                              |                                                                                    | 50.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                    | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  |                                                                                   | 25.5                                                                              |                                                                                   | 45.5                                                                              |                                                                                   | 25.5                                                                              |                                                                                    | 45.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s |                                                                                   | 8.1                                                                               |                                                                                   | 16.2                                                                              |                                                                                   | 12.2                                                                              |                                                                                    | 8.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      |                                                                                   | 2.1                                                                               |                                                                                   | 6.0                                                                               |                                                                                   | 1.8                                                                               |                                                                                    | 6.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 15.8                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 1: Gayley Road/La Loma Avenue & Hearst Avenue








08/27/2018




|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |                                                                                    |  |  |                                                                                     |  |                                                                                     |
| Traffic Volume (veh/h)       | 23                                                                                | 33                                                                                | 255                                                                               | 62                                                                                | 118                                                                               | 30                                                                                | 204                                                                                | 277                                                                                 | 22                                                                                  | 7                                                                                   | 224                                                                                 | 23                                                                                  |
| Future Volume (veh/h)        | 23                                                                                | 33                                                                                | 255                                                                               | 62                                                                                | 118                                                                               | 30                                                                                | 204                                                                                | 277                                                                                 | 22                                                                                  | 7                                                                                   | 224                                                                                 | 23                                                                                  |
| Number                       | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 7                                                                                  | 4                                                                                   | 14                                                                                  | 3                                                                                   | 8                                                                                   | 18                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.89                                                                              |                                                                                   | 0.84                                                                              | 0.91                                                                              |                                                                                   | 0.81                                                                              | 0.94                                                                               |                                                                                     | 1.00                                                                                | 0.98                                                                                |                                                                                     | 0.85                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1976                                                                                | 1976                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 25                                                                                | 35                                                                                | 274                                                                               | 67                                                                                | 127                                                                               | 32                                                                                | 219                                                                                | 298                                                                                 | 0                                                                                   | 8                                                                                   | 241                                                                                 | 25                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                  | 1                                                                                   | 1                                                                                   | 0                                                                                   | 1                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.93                                                                              | 0.93                                                                              | 0.93                                                                              | 0.93                                                                              | 0.93                                                                              | 0.93                                                                              | 0.93                                                                               | 0.93                                                                                | 0.93                                                                                | 0.93                                                                                | 0.93                                                                                | 0.93                                                                                |
| Percent Heavy Veh, %         | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Cap, veh/h                   | 223                                                                               | 288                                                                               | 437                                                                               | 346                                                                               | 449                                                                               | 113                                                                               | 414                                                                                | 498                                                                                 | 939                                                                                 | 57                                                                                  | 919                                                                                 | 93                                                                                  |
| Arrive On Green              | 0.32                                                                              | 0.32                                                                              | 0.32                                                                              | 0.32                                                                              | 0.32                                                                              | 0.32                                                                              | 0.56                                                                               | 0.56                                                                                | 0.00                                                                                | 0.56                                                                                | 0.56                                                                                | 0.56                                                                                |
| Sat Flow, veh/h              | 482                                                                               | 892                                                                               | 1357                                                                              | 993                                                                               | 1392                                                                              | 351                                                                               | 620                                                                                | 891                                                                                 | 1680                                                                                | 15                                                                                  | 1643                                                                                | 166                                                                                 |
| Grp Volume(v), veh/h         | 60                                                                                | 0                                                                                 | 274                                                                               | 67                                                                                | 0                                                                                 | 159                                                                               | 517                                                                                | 0                                                                                   | 0                                                                                   | 274                                                                                 | 0                                                                                   | 0                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1375                                                                              | 0                                                                                 | 1357                                                                              | 993                                                                               | 0                                                                                 | 1742                                                                              | 1511                                                                               | 0                                                                                   | 1680                                                                                | 1825                                                                                | 0                                                                                   | 0                                                                                   |
| Q Serve(g_s), s              | 0.1                                                                               | 0.0                                                                               | 13.0                                                                              | 4.1                                                                               | 0.0                                                                               | 5.2                                                                               | 10.7                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 5.3                                                                               | 0.0                                                                               | 13.0                                                                              | 9.4                                                                               | 0.0                                                                               | 5.2                                                                               | 16.5                                                                               | 0.0                                                                                 | 0.0                                                                                 | 5.9                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.42                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.20                                                                              | 0.42                                                                               |                                                                                     | 1.00                                                                                | 0.03                                                                                |                                                                                     | 0.09                                                                                |
| Lane Grp Cap(c), veh/h       | 510                                                                               | 0                                                                                 | 437                                                                               | 346                                                                               | 0                                                                                 | 562                                                                               | 913                                                                                | 0                                                                                   | 939                                                                                 | 1069                                                                                | 0                                                                                   | 0                                                                                   |
| V/C Ratio(X)                 | 0.12                                                                              | 0.00                                                                              | 0.63                                                                              | 0.19                                                                              | 0.00                                                                              | 0.28                                                                              | 0.57                                                                               | 0.00                                                                                | 0.00                                                                                | 0.26                                                                                | 0.00                                                                                | 0.00                                                                                |
| Avail Cap(c_a), veh/h        | 510                                                                               | 0                                                                                 | 437                                                                               | 346                                                                               | 0                                                                                 | 562                                                                               | 913                                                                                | 0                                                                                   | 939                                                                                 | 1069                                                                                | 0                                                                                   | 0                                                                                   |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 0.00                                                                                | 0.00                                                                                | 1.00                                                                                | 0.00                                                                                | 0.00                                                                                |
| Uniform Delay (d), s/veh     | 18.1                                                                              | 0.0                                                                               | 21.9                                                                              | 22.7                                                                              | 0.0                                                                               | 19.2                                                                              | 10.8                                                                               | 0.0                                                                                 | 0.0                                                                                 | 8.7                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 6.6                                                                               | 1.2                                                                               | 0.0                                                                               | 1.3                                                                               | 2.5                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.6                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.9                                                                               | 0.0                                                                               | 5.7                                                                               | 1.2                                                                               | 0.0                                                                               | 2.7                                                                               | 7.7                                                                                | 0.0                                                                                 | 0.0                                                                                 | 3.1                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| LnGrp Delay(d),s/veh         | 18.5                                                                              | 0.0                                                                               | 28.5                                                                              | 24.0                                                                              | 0.0                                                                               | 20.5                                                                              | 13.4                                                                               | 0.0                                                                                 | 0.0                                                                                 | 9.3                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | B                                                                                  |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Approach Vol, veh/h          |                                                                                   | 334                                                                               |                                                                                   |                                                                                   | 226                                                                               |                                                                                   |                                                                                    | 517                                                                                 |                                                                                     |                                                                                     | 274                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 26.7                                                                              |                                                                                   |                                                                                   | 21.5                                                                              |                                                                                   |                                                                                    | 13.4                                                                                |                                                                                     |                                                                                     | 9.3                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 |                                                                                   | 2                                                                                 |                                                                                   | 4                                                                                 |                                                                                   | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     |                                                                                   | 29.0                                                                              |                                                                                   | 47.0                                                                              |                                                                                   | 29.0                                                                              |                                                                                    | 47.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                   | 4.5                                                                               |                                                                                    | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  |                                                                                   | 24.5                                                                              |                                                                                   | 42.5                                                                              |                                                                                   | 24.5                                                                              |                                                                                    | 42.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s |                                                                                   | 11.4                                                                              |                                                                                   | 18.5                                                                              |                                                                                   | 15.0                                                                              |                                                                                    | 7.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      |                                                                                   | 2.5                                                                               |                                                                                   | 6.3                                                                               |                                                                                   | 2.1                                                                               |                                                                                    | 6.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 17.2                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

| Intersection             |        |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |
|--------------------------|--------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0.5    |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |
| Movement                 | EBL    | EBR                                                                               | NBL   | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations      |        |  |       |  |  |  |
| Traffic Vol, veh/h       | 0      | 5                                                                                 | 26    | 200                                                                               | 297                                                                               | 25                                                                                |
| Future Vol, veh/h        | 0      | 5                                                                                 | 26    | 200                                                                               | 297                                                                               | 25                                                                                |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Sign Control             | Stop   | Stop                                                                              | Free  | Free                                                                              | Free                                                                              | Free                                                                              |
| RT Channelized           | -      | None                                                                              | -     | None                                                                              | -                                                                                 | None                                                                              |
| Storage Length           | -      | 0                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Veh in Median Storage, # | 0      | -                                                                                 | -     | 0                                                                                 | 0                                                                                 | -                                                                                 |
| Grade, %                 | 0      | -                                                                                 | -     | 0                                                                                 | 0                                                                                 | -                                                                                 |
| Peak Hour Factor         | 100    | 100                                                                               | 100   | 100                                                                               | 100                                                                               | 100                                                                               |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2                                                                                 |
| Mvmt Flow                | 0      | 5                                                                                 | 26    | 200                                                                               | 297                                                                               | 25                                                                                |
| Major/Minor              | Minor2 | Major1                                                                            |       | Major2                                                                            |                                                                                   |                                                                                   |
| Conflicting Flow All     | -      | 310                                                                               | 322   | 0                                                                                 | -                                                                                 | 0                                                                                 |
| Stage 1                  | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Stage 2                  | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Critical Hdwy            | -      | 6.22                                                                              | 4.12  | -                                                                                 | -                                                                                 | -                                                                                 |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Follow-up Hdwy           | -      | 3.318                                                                             | 2.218 | -                                                                                 | -                                                                                 | -                                                                                 |
| Pot Cap-1 Maneuver       | 0      | 730                                                                               | 1238  | -                                                                                 | -                                                                                 | -                                                                                 |
| Stage 1                  | 0      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Stage 2                  | 0      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Platoon blocked, %       |        |                                                                                   |       | -                                                                                 | -                                                                                 | -                                                                                 |
| Mov Cap-1 Maneuver       | -      | 730                                                                               | 1238  | -                                                                                 | -                                                                                 | -                                                                                 |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Stage 1                  | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Stage 2                  | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -                                                                                 |
| Approach                 | EB     | NB                                                                                |       | SB                                                                                |                                                                                   |                                                                                   |
| HCM Control Delay, s     | 10     | 0.9                                                                               |       | 0                                                                                 |                                                                                   |                                                                                   |
| HCM LOS                  | B      |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |
| Minor Lane/Major Mvmt    | NBL    | NBT                                                                               | EBLn1 | SBT                                                                               | SBR                                                                               |                                                                                   |
| Capacity (veh/h)         | 1238   | -                                                                                 | 730   | -                                                                                 | -                                                                                 |                                                                                   |
| HCM Lane V/C Ratio       | 0.021  | -                                                                                 | 0.007 | -                                                                                 | -                                                                                 |                                                                                   |
| HCM Control Delay (s)    | 8      | 0                                                                                 | 10    | -                                                                                 | -                                                                                 |                                                                                   |
| HCM Lane LOS             | A      | A                                                                                 | B     | -                                                                                 | -                                                                                 |                                                                                   |
| HCM 95th %tile Q(veh)    | 0.1    | -                                                                                 | 0     | -                                                                                 | -                                                                                 |                                                                                   |

Queues  
1: Gayley Road/La Loma Avenue & Hearst Avenue

Upper Hearst TIA  
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| Lane Group              | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBT                                                                               | NBR                                                                               | SBT                                                                                |
| Lane Group Flow (vph)   | 157                                                                               | 229                                                                               | 19                                                                                | 44                                                                                | 427                                                                               | 67                                                                                | 311                                                                                |
| v/c Ratio               | 0.27                                                                              | 0.37                                                                              | 0.06                                                                              | 0.07                                                                              | 0.58                                                                              | 0.08                                                                              | 0.32                                                                               |
| Control Delay           | 21.9                                                                              | 5.0                                                                               | 19.7                                                                              | 18.2                                                                              | 15.1                                                                              | 4.1                                                                               | 10.0                                                                               |
| Queue Delay             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                |
| Total Delay             | 21.9                                                                              | 5.0                                                                               | 19.7                                                                              | 18.2                                                                              | 15.1                                                                              | 4.1                                                                               | 10.0                                                                               |
| Queue Length 50th (ft)  | 58                                                                                | 0                                                                                 | 7                                                                                 | 14                                                                                | 126                                                                               | 5                                                                                 | 74                                                                                 |
| Queue Length 95th (ft)  | 105                                                                               | 47                                                                                | 21                                                                                | 36                                                                                | 214                                                                               | 21                                                                                | 121                                                                                |
| Internal Link Dist (ft) | 157                                                                               |                                                                                   |                                                                                   | 326                                                                               | 271                                                                               |                                                                                   | 23                                                                                 |
| Turn Bay Length (ft)    |                                                                                   | 50                                                                                | 40                                                                                |                                                                                   |                                                                                   | 40                                                                                |                                                                                    |
| Base Capacity (vph)     | 577                                                                               | 611                                                                               | 334                                                                               | 594                                                                               | 737                                                                               | 866                                                                               | 982                                                                                |
| Starvation Cap Reductn  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  |
| Spillback Cap Reductn   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  |
| Storage Cap Reductn     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  |
| Reduced v/c Ratio       | 0.27                                                                              | 0.37                                                                              | 0.06                                                                              | 0.07                                                                              | 0.58                                                                              | 0.08                                                                              | 0.32                                                                               |
| Intersection Summary    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

| Intersection             |        |                                                                                   |       |                                                                                   |                                                                                   |      |
|--------------------------|--------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|
| Int Delay, s/veh         | 0.8    |                                                                                   |       |                                                                                   |                                                                                   |      |
| Movement                 | EBL    | EBR                                                                               | NBL   | NBT                                                                               | SBT                                                                               | SBR  |
| Lane Configurations      |        |  |       |  |  |      |
| Traffic Vol, veh/h       | 0      | 48                                                                                | 4     | 326                                                                               | 206                                                                               | 4    |
| Future Vol, veh/h        | 0      | 48                                                                                | 4     | 326                                                                               | 206                                                                               | 4    |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    |
| Sign Control             | Stop   | Stop                                                                              | Free  | Free                                                                              | Free                                                                              | Free |
| RT Channelized           | -      | None                                                                              | -     | None                                                                              | -                                                                                 | None |
| Storage Length           | -      | 0                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Veh in Median Storage, # | 0      | -                                                                                 | -     | 0                                                                                 | 0                                                                                 | -    |
| Grade, %                 | 0      | -                                                                                 | -     | 0                                                                                 | 0                                                                                 | -    |
| Peak Hour Factor         | 100    | 100                                                                               | 100   | 100                                                                               | 100                                                                               | 100  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2    |
| Mvmt Flow                | 0      | 48                                                                                | 4     | 326                                                                               | 206                                                                               | 4    |
| Major/Minor              | Minor2 | Major1                                                                            |       | Major2                                                                            |                                                                                   |      |
| Conflicting Flow All     | -      | 208                                                                               | 210   | 0                                                                                 | -                                                                                 | 0    |
| Stage 1                  | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Stage 2                  | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Critical Hdwy            | -      | 6.22                                                                              | 4.12  | -                                                                                 | -                                                                                 | -    |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Follow-up Hdwy           | -      | 3.318                                                                             | 2.218 | -                                                                                 | -                                                                                 | -    |
| Pot Cap-1 Maneuver       | 0      | 832                                                                               | 1361  | -                                                                                 | -                                                                                 | -    |
| Stage 1                  | 0      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Stage 2                  | 0      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Platoon blocked, %       |        |                                                                                   |       | -                                                                                 | -                                                                                 | -    |
| Mov Cap-1 Maneuver       | -      | 832                                                                               | 1361  | -                                                                                 | -                                                                                 | -    |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Stage 1                  | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Stage 2                  | -      | -                                                                                 | -     | -                                                                                 | -                                                                                 | -    |
| Approach                 | EB     | NB                                                                                |       | SB                                                                                |                                                                                   |      |
| HCM Control Delay, s     | 9.6    | 0.1                                                                               |       | 0                                                                                 |                                                                                   |      |
| HCM LOS                  | A      |                                                                                   |       |                                                                                   |                                                                                   |      |
| Minor Lane/Major Mvmt    | NBL    | NBT                                                                               | EBLn1 | SBT                                                                               | SBR                                                                               |      |
| Capacity (veh/h)         | 1361   | -                                                                                 | 832   | -                                                                                 | -                                                                                 |      |
| HCM Lane V/C Ratio       | 0.003  | -                                                                                 | 0.058 | -                                                                                 | -                                                                                 |      |
| HCM Control Delay (s)    | 7.7    | 0                                                                                 | 9.6   | -                                                                                 | -                                                                                 |      |
| HCM Lane LOS             | A      | A                                                                                 | A     | -                                                                                 | -                                                                                 |      |
| HCM 95th %tile Q(veh)    | 0      | -                                                                                 | 0.2   | -                                                                                 | -                                                                                 |      |



Queues  
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Upper Hearst TIA  
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| Lane Group              | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBT                                                                               | NBR                                                                               | SBT                                                                                |
| Lane Group Flow (vph)   | 58                                                                                | 263                                                                               | 64                                                                                | 153                                                                               | 496                                                                               | 23                                                                                | 262                                                                                |
| v/c Ratio               | 0.11                                                                              | 0.41                                                                              | 0.17                                                                              | 0.26                                                                              | 0.60                                                                              | 0.03                                                                              | 0.26                                                                               |
| Control Delay           | 20.1                                                                              | 5.1                                                                               | 21.3                                                                              | 19.4                                                                              | 15.3                                                                              | 3.9                                                                               | 9.2                                                                                |
| Queue Delay             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                |
| Total Delay             | 20.1                                                                              | 5.1                                                                               | 21.3                                                                              | 19.4                                                                              | 15.3                                                                              | 3.9                                                                               | 9.2                                                                                |
| Queue Length 50th (ft)  | 20                                                                                | 0                                                                                 | 23                                                                                | 50                                                                                | 150                                                                               | 1                                                                                 | 58                                                                                 |
| Queue Length 95th (ft)  | 47                                                                                | 50                                                                                | 52                                                                                | 95                                                                                | 247                                                                               | 10                                                                                | 98                                                                                 |
| Internal Link Dist (ft) | 157                                                                               |                                                                                   |                                                                                   | 326                                                                               | 271                                                                               |                                                                                   | 21                                                                                 |
| Turn Bay Length (ft)    |                                                                                   | 50                                                                                | 40                                                                                |                                                                                   |                                                                                   | 40                                                                                |                                                                                    |
| Base Capacity (vph)     | 515                                                                               | 634                                                                               | 371                                                                               | 586                                                                               | 820                                                                               | 856                                                                               | 1004                                                                               |
| Starvation Cap Reductn  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  |
| Spillback Cap Reductn   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  |
| Storage Cap Reductn     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  |
| Reduced v/c Ratio       | 0.11                                                                              | 0.41                                                                              | 0.17                                                                              | 0.26                                                                              | 0.60                                                                              | 0.03                                                                              | 0.26                                                                               |
| Intersection Summary    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |