January 2004

Underhill Area Streetscape Design Guidelines

UNIVERSITY OF CALIFORNIA, BERKELEY
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UNDERHILL AREA STREETSCAPE DESIGN GUIDELINES

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Design Guidelines

The design guidelines presented in this section provide general descriptions of streetscape character as well as specific methods in which to achieve the desired improvements. A summary of these guidelines is located on page 45. A selection of City of Berkeley standard details can be found in Appendix D.

Prototypical Street Layout

Many factors effect the overall streetscape layout. Physical constraints such as driveways, building entrances, and utility poles all significantly influence the final arrangement of streetscape elements. A prototypical streetscape layout shown illustrates the basic design standards. Optimally, the final layout of elements should be determined on a block-by-block basis. When making adjustments, it is important to retain design consistency by adhering to the basic concepts presented in the prototypical layout; i.e. tree/light relationship, and street furnishings arrangement. The end result would be a cohesive and consistent visual identity for the entire district.

Setback Conditions

The typical streetscape improvements recommended occur within the public right-of-way. The overall character of the
Setback Improvements

C-T or R-SMU Zoning District
- 0’ Setback
- Back of Walk Furnishings at Blank Walls Only

R-S Zoning District
- 0’-10’ Setback
- Small/Medium Shrubs Recommended in Setback Area

R-3 Zoning District
- 15’ Setback
- Can Accommodate Street Trees at Back of Walk; i.e. Bus Stops
- Small/Medium Ornamental Trees Recommended in Setback Area
- Consider Benches at Back of Walk

* Refer to Special Conditions - 1:
  Bus Stop at Curb
area can be greatly enhanced by integrating the streetscape improvements with landscaping within the private property building setbacks. Current private property plantings give the area a “green” appearance even with the distinct lack of street trees. The University and City should encourage landscaping outside the public right-of-way within the building setback area. Recommended setback improvements range from the planting of shrubs and ornamental trees to the addition of street furnishings such as benches at the back of walk where space allows. New development should consider coordinating setback improvements with the streetscape elements to create a cohesive and aesthetically pleasing pedestrian environment.

1. Sidewalks

Sidewalks are the backbone of a safe pedestrian environment along streets. However, the current sidewalk conditions within the Underhill area do not adequately serve the high volume of pedestrian traffic. Many of the sidewalks are broken or uneven, creating tripping hazards and causing difficulty for persons with mobility impairments. Remnant planting strips and open tree wells tend to be poorly maintained, detracting from the streetscape appearance and decreasing the amount of walking surface. Improving the sidewalk surface is essential to supporting current and future pedestrian traffic volumes.

The recommended minimum width for all sidewalks within the Underhill study area is 10.5’. Wider sidewalks should be considered where space allows. For infill projects in areas with existing sidewalks, the new sidewalk should meet the recommended width of 10.5’ or match the existing width if greater than 10.5’. In some cases, building and curbline constraints may only allow for a 8’ or 6’ sidewalk. Diagrams on page 27 illustrate the recommended layout for trees and lighting where these situations occur.

The preferred sidewalk would be composed of two functional areas: a 4’ furnishings zone, and a 6’ through pedestrian zone. The furnishings zone is measured 4’ from the back of curb. It buffers pedestrians from the adjacent roadway, and provides an area where elements such as street trees, signal poles, utility poles, street lights, hydrants, signs, parking meters, driveway aprons, and grates should be located. This is also where people alight from parked cars. The through pedestrian zone
Existing Sidewalk Renovation
Sidewalk Conditions

10' Sidewalk

8' Sidewalk

6' Sidewalk

Score Joints Align w/Tree Grates (typ.)

4'x4' Tree Grate (typ.)

2' typ.

4 min.
is the portion of the sidewalk that provides a space for walking that is removed from vehicle traffic and obstructions. Separating pedestrians from travel lanes greatly increases their comfort and sense of safety. In some instances it may be appropriate to locate benches along the back of sidewalk rather than within the furnishing zone, provided a 6’ clear pedestrian corridor can be maintained.

a. Paving
Paving surfaces should be firm, stable, and allow for ease of passage by people using canes, wheelchairs, or other devices to assist mobility. The through pedestrian corridor should generally be concrete to provide an even walking surface. Unit pavers should be considered within the corner bulb-outs to unify the area as a unique district. Sidewalk scoring for all streets within the district on should be as shown in the “Sidewalk Conditions” illustration.

b. Cross Slope
Walking surfaces should be relatively level, yet allow for surface drainage. The preferred cross slope for the entire paved sidewalk is 1.5%, with a maximum cross slope of 2%. If a greater slope is anticipated, because of atypical topographic or existing conditions, the 1.5% preferred slope should be maintained within the 6’ minimum circulation corridor. This can be accomplished by placing the more steeply angled slope within the furnishings zone, except at bus stops where gradient should follow street grade.

c. Driveways
Driveway aprons should not intrude into the through-pedestrian zone. In the preferred condition, the through pedestrian zone is maintained across the entire driveway and is scored with the sidewalk pattern. The sloped portion of the driveway apron should be located entirely within the furnishings zone. Driveway construction should comply with the City of Berkeley “Standard Driveway Approach Detail.”

d. Planting Strips
Existing curbside planting strips should be paved to increase the usable pedestrian surface and eliminate the need for continual maintenance.
2. Street Corners

Pedestrian activity is generally concentrated at street corners. Sidewalks converge, walkers wait for crossing opportunities, and people stop and converse. Street corners are also important in the larger scheme of street systems: they are the logical location for markers such as street name signs and traffic control signals. Generally, existing street corners offer little refuge and often overflow with pedestrians spilling into the street during peak automobile traffic periods. Visibility at corners is an issue for all users of the street system.

To alleviate the congestion and provide a more gracious pedestrian environment, corner bulb-outs should be considered. Bulb-outs expand the street corner, increase pedestrian visibility, and reduce pedestrian crossing distances (see diagrams on page 23 and 32). Bulb-outs should not be installed where there is no curbside parking.

Corner bulb-outs should extend approximately 6’ from the face of the existing curb, with a 10’ outside radius for street sweeping. Bulb-outs should have a minimum length of 20’, with 36’ length preferred to allow more room for pedestrian clustering.

a. Extended Bulb-Outs

Extended bulb-outs should be used in locations where there is a need for pedestrian amenities such as benches, trash receptacles, information kiosks, and bike racks. The extended bulb-out would expand the furnishing zone from 4’ to 10’ and allow for a greater range of furnishings.
Corner Bulb-Outs

- Full Bulb-Out: Where curbside parking exists or is proposed on adjacent streets.
- Half Bulb-Out: Where right turn lane is required with no curbside parking.
- Half Bulb-Out: Where curbside parking exists or is proposed on one street but not on the other, e.g., bike lane.
- Typical Dimensions: Includes property line, former curbline, and enhanced crosswalk dimensions.
Extended Bulb-Out w/Furnishings Area
b. Curb Ramps
Curb ramps allow users to make the transition in grade from the street to the sidewalk. Ideally, there should be a separate curb ramp for each crosswalk at a corner. The maximum ramp slope is 1:12 with a cross slope of no more than 1.5%. The minimum width of a ramp is 3’. The landing at the top of the ramp should be at least 4’ long and at least the same width as the ramp itself. All curb ramps should comply with the City of Berkeley’s standard wheelchair ramp details.

c. Corner Sight Triangle
The corner triangle area of a street corner is the space between the curb and the lines created by extending the property line to the curb face as shown below. Permanent obstructions such as street trees, power poles, and other vertical elements should be minimized in this area to ensure proper visibility for motorists. The recommended corner triangle should extend 30’ from the face of the curb.
3. **Street Trees**

Street trees serve a variety functions in the streetscape - they supply shade, buffer wind, screen unsightly views, provide neighborhood character, and buffer people from cars. Street trees provide pedestrians with a sense of comfort by limiting their exposure to the sun and cars. In general, the residential areas surrounding the study area have regularly spaced, mature street trees which give the neighborhoods a distinct and attractive character. Within the Underhill area, however, street trees can be sporadic in some areas, removed or non-existent in others. Consistent street tree planting in this area will greatly improve neighborhood aesthetics and pedestrian comfort.

a. **Tree Location**

New infill street trees should be planted in 4’x4’ tree wells within the furnishing zone. Trees should be located at a regular spacing with adjustments made to avoid driveways, utility poles, and other fixed elements where necessary and aligned where possible with striping and curbside parking. Any adjustment to the recommended tree spacing should be done in full block increments. The location for street trees should be determined during the early stages of the planning process to ensure that space is reserved for trees installed in future development phases. Existing trees that are dead, diseased, or inappropriate should be removed and replaced with the species recommended for the particular street. Specific tree planting guidelines are as follows:

- Trees should be a minimum 24” box size at planting.
- Trees should be regularly spaced at 25’ on center (or more as noted for species) within the 4’ furnishing zone. Spacing may need to be adjusted slightly to avoid driveways and utility poles.
- Trees should be located at least 15’ from utility poles.
- Trees should be located at least 10’ from driveway lines.
- Trees should not be planted closer than 3” from the curb face at intersections and street corners within the corner triangle.
- Branching height of mature trees must not interfere with visibility of traffic control devices.
- Trees should be located a minimum of 30” from the face of curb.
• The branching height of *mature* trees on the street side should be maintained at no less than 14’ above the street.
• The branching height of *mature* trees on the pedestrian side should be maintained at no less than 8’ above the street.

b. **Tree Selection**

The goal of the plan is to match appropriate tree species to each street within the Underhill area and to create a distinct character and image for each. Tree selections for the Underhill area streets are based on the City of Berkeley’s South Campus Street Tree Planting Plan (see Appendix E) to maintain continuity with the greater neighborhood. Existing mature trees should be incorporated into the overall plan whenever possible.

Recommended tree species by street are as follows:

- **College Avenue** – London Plane ‘Columbia’ (*Platanus acerifolia ‘Columbia’*)
- **Bowditch Street** – Chinese Pistache (*Pistacia chinensis*)
- **Durant Avenue - Scarlet Oak** (*Quercus coccinea*)
- **Channing Way** – Red Sunset Red Maple (*Acer rubrum ‘Red Sunset’*)
- **Haste Street** - Ginko ‘Autumn Gold’ (*Ginko biloba ‘Autumn Gold’*)
- **Dwight Way** - Frontier Elm (*Ulms hybrid ‘Frontier’*)
c. **Tree Wells and Grates**

Tree wells should be measure 4’x4’ and be covered with uncoated cast iron grates. Where sidewalks are less than seven feet wide the tree grate well should be 3’x6’ and covered with a custom cast iron grate with a style equivalent to that of the standard grate specified below. Existing mature trees that are to be retained should be fitted with grates or surrounded by an ADA acceptable surface such as decomposed granite to ensure an even pedestrian surface. All grates within the sidewalk should be flush with the level of the surrounding sidewalk surface, and be located within the furnishings zone. The recommended tree grate is style #R-8706-1A, by Neenah Foundry Company or EQ as per the City of Berkeley’s Street Tree Planting Policies/Guidelines.

d. **Tree Guards**

Tree guards should be installed where appropriate to protect trees and ensure their longevity. The recommended tree guard is style C with a black powder coat, by Neenah Foundry Company or EQ as per the Berkeley’s Street Tree Planting Policies/Guidelines.

e. **Structural Soil**

Structural soil is an air-entrained mixture of quality aggregate and “soil” formulated to support various pavement types, while allowing voids for air exchange, water movement, organic matter, and root growth. Structural soil installed under paving allows tree roots to grow out of the tree well and under the adjacent sidewalk without causing the pavement to heave or buckle. This greatly increases the long-term health of the tree while ensuring that sidewalk surface remains even. It is strongly recommended that structural soil be used for all new street tree plantings. See the planting detail for recommended structural soil locations.

f. **Trees in Parking Zone**

Some sidewalk widths or subsurface utilities may constrain the planting of street trees along the entire frontage. In these instances it is recommended that street trees be located in tree wells within the parking zone. This will help maintain both a consistent streetscape design and the recommended pedestrian corridor. Tree wells in the parking zone should measure 6’x12’ to allow room for cars to back out of parking spaces without damaging
Street Tree Details
the tree. Smaller tree wells may be used if concrete bumpers are installed in the parking strip to act as wheel stops. Recommended spacing and placement of tree wells in shown in the illustration on the previous page.

4. Lighting

Pedestrian-oriented lighting improves visibility, increases the sense of personal safety, and adds to the overall streetscape character. Currently, lighting in the Underhill study area is limited to “cobra-head” fixtures mounted on utility poles which provide only sporadic coverage. As a result, lighting levels, while recently improved, are generally inadequate. The large number of housing units, dining hall and proposed sports complex along with the area’s proximity to campus will create a very active nighttime environment. Consistent lighting coverage is essential for improving the safety and visibility of pedestrians in this heavily-used area.

a. Location

New pedestrian-scale lighting should be installed on all streets within the Underhill area to replace the existing “cobra-head” fixtures. Fixtures should be located at approximately 75’ on center to provide consistent coverage on all streets. Light placement should be coordinated with existing and proposed street tree planting to ensure that fixture illumination is not blocked by trees. Pedestrian-oriented light fixtures should be mounted at approximately 12’ above sidewalk grade; beneath the tree canopy. Any adjustment to the recommended light spacing should be done in full block increments.

b. Design Concept

The recommended light fixtures are intended to increase the amount of coverage and establish the desired community character. College and Bowditch both lead directly to the UC Berkeley campus and should be highlighted as major gateway streets and safety corridors due to the heavy amount of pedestrian, bike and vehicular traffic. Both residents of and visitors to the campus travel via these corridors making them the most appropriate locations for signage that highlights special events and community character. The recommended fixture for these two streets is a high/low design that provide illumination for both roadway and sidewalk. In addition, these fixtures
provide space for banner signs that can be changed to reflect campus activities or community events. The recommended fixture for north/south streets is a simple acorn style, similar to the lights recently installed on Piedmont Avenue just north of the Study Area.

c. **Recommended Fixtures**

Lighting fixtures must meet the minimum footcandle standard specified by the IES guidelines. Recommended lights by street are as follows:

- College Avenue, Bowditch Street – to be determined by the City of Berkeley
- Durant Avenue, Channing Way, Haste Street, Dwight Way – SBP Battery Park by Sentry

5. **Furnishings**

All street furnishings within the Underhill area should be finished to the City of Berkeley’s standard color. The only exception to this standard applies to furnishings located along the northern frontage of the Bancroft. Furnishings installed in this location should be finished to match the University standard color, Elephants Breath.

a. **Benches**

Benches should be provided where there is space for a clear circulation corridor and separate seating zone.
Bench can be located along the back of sidewalk where appropriate or within a corner bulb-out. The preferred type of seating is a 6’ metal bench with a center armrest and no end armrests for disabled seating. The bench should be permanently secured to the paving surface. The recommended bench is the Scarborough by Landscape Forms or EQ.

b. Trash Receptacles
Trash/Recycling receptacles should be easily accessible to pedestrians and conveniently placed near activity nodes such as corners and bus stops. Every corner bulb-out should have a trash/recycling receptacle. Where appropriate, they should be arranged with other streetscape elements to create functional compositions. Receptacles should not be placed directly adjacent to benches. The recommended trash receptacle is the Urban Renaissance Receptacle, part #970270 by Forms+Surfaces or EQ.

c. Bicycle Racks
Bicycle racks should be provided at extended corner bulb-outs that are located near high-traffic destinations. Racks should be placed perpendicular to the curb so that parked bicycles will not intrude into the pedestrian corridor or car exit zone. The recommended bicycle rack is the hoop rack by Dero or EQ.

d. Newspaper Racks
Newspaper racks should be clustered together wherever possible and located near pedestrian activity nodes. Racks should be consolidated in a single stacked fixture whenever possible. The recommended location for newspaper racks is against a building wall or within an extended corner bulb-out. If they are placed against a building wall, the 6’ clear pedestrian corridor must be maintained. Placement in a bulb-out should not obstruct the view of drivers at the intersection.

e. Kiosks
Kiosks should be designed to provide a space for posting community notices and flyers and exclude commercial advertising. They should be easily accessible from all sides and easy to maintain. Kiosks may include semi-permanent features such as area maps or heritage signage that highlights the history and character of the neighborhood. The recommended location for kiosks is within an ex-
tended corner bulb-out where they can be grouped with other furnishings. The kiosk design should be complementary to other street furnishings.

f. Code Blue Units
Code Blue units are emergency call stations installed by the University both on campus and within the surrounding student resident neighborhoods including the Underhill area. These units should be wheelchair accessible and located within the site furnishings zone or grouped with other elements within the corner bulb-outs.

g. Signage
The Underhill area should have a coordinated system of directional and informational signage that is aesthetically pleasing, consistent and appropriately located. Signage should provide direction to key area destinations such as public parking, museums, stadiums, the UC campus, and the Telegraph Avenue shopping district. All directional and informational signage should be consolidated and grouped with other streetscape elements and located within the corner bulb-outs. Signage should not be placed in areas that obstruct the motorists view.

h. Parking Meters
Parking meters should be coordinated with the location of parking stalls per the City of Berkeley’s Standard Setting Parking Meter Post. Meters should be placed within the furnishings zone and aligned with lights and street trees. Standard meter base covers and poles should be painted to match street furnishings where feasible. Where possible, existing individual meters should be upgraded to one meter per four stalls similar to conditions in downtown Berkeley.

Special Conditions
a. Bus Stops
Public transportation is vital to the Underhill area and its use should be encouraged to avoid increased vehicular congestion. Guidelines for transit stop improvements have been included in this document. Several options are presented in the illustration on the following page. Improvement recommendations range from the addition of basic furnishings such as benches and trash receptacles,
Bus Stop with Bench

Bus Stop w/Shelter

Locate Trees at Back of Walk if Space Permits

Bench and Trash Receptacle (typ.)

60' min. for AC Transit Bus Stop

Trees at Back of Walk
to extended bulb-outs with bus shelters. AC Transit has a standard bus shelter design that they will install and maintain in conjunction with the City of Berkeley. Improvements should be coordinated with AC Transit to ensure consistency in design and practicality.

b. Mid-Block Crossings
Mid-block crossings should be considered in locations where there is a significant demand for crossing and no nearby existing crosswalk. Mid-block crossings should be aligned with logical pedestrian travel patterns. Design recommendations that should be considered for mid-block crossings include curb bulb-outs, flashing roadway lights, signage, and enhanced striping or special paving materials as shown in the illustration below.

Mid-block crossings should be considered in locations where high pedestrian demand exists. Mid-block crossing design recommendations include a variety of measures from flashing road lights to special paving.
**Design Standards Summary**

Below is a summary of design standards as described in the Design Guidelines. This information should be used as an initial reference for specific streetscape improvement projects. Construction details contained in this appendix were obtained from the City of Berkeley in September of 2003. These construction details should be verified with the City of Berkeley before the initial plan submittal to ensure compliance with current standards.

**City of Berkeley Contact Information**
- Public Works (510) 981-6300
- Transportation (510) 981-7010
- Parks, Recreation and Waterfront (510) 981-6700
- Land Use Planning (510) 981-7410
- Bicycle Planner (510) 981-7062

**Sidewalk Standards**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>10’ preferred, 6’ minimum</td>
</tr>
<tr>
<td>Cross Slope</td>
<td>1.5%, 3/16” per foot</td>
</tr>
<tr>
<td>Curb</td>
<td>6” COB standard curb section</td>
</tr>
<tr>
<td>Corner Radius</td>
<td>10’ minimum</td>
</tr>
<tr>
<td>Ramp Design</td>
<td>COB standard detail Case 1 preferred</td>
</tr>
<tr>
<td>Scoring</td>
<td>Score joints align with tree grates</td>
</tr>
<tr>
<td>Driveways</td>
<td></td>
</tr>
<tr>
<td>Corner Bulb-Out</td>
<td>Length 35’ from existing curb line as space allows</td>
</tr>
<tr>
<td></td>
<td>Width 6’ from existing curbline</td>
</tr>
<tr>
<td></td>
<td>Return 8’ with 5’ inside and outside radii</td>
</tr>
</tbody>
</table>

**Street Trees**

| Placement           | 30’ from corner curb face                             |
|                     | 25’ O.C. preferred, specific spacing of trees to be completed on a block by block basis |
|                     | Centerline 2.5’ from adjacent curb face               |
| Structural Soil     | Recommended under entire furnishings zone with partial sidewalk reconstruction or full sidewalk width where complete sidewalk construction occurs |
| Species             | College Avenue - London Plane Tree ‘Columbia’         |
|                     | Bowditch Street - Chinese Pistache                    |
| Species (cont.)     | Durant Avenue - Scarlet Oak                           |
|                     | Channing Way - Red Sunset Red Maple                   |
|                     | Haste Street - Ginko ‘Autumn Gold’                    |
|                     | Dwight Way - Frontier Elm                             |
| Grate               | Neenah Foundry R-8706-1A (4x4)                        |
Guard   Neenah tree guard type C, 5’
Existing Trees  (permit to trim or remove) COB Parks, Recreation, and Waterfront

Lighting

Placement  75’ on center, equidistant between street trees
Fixtures
East/West Streets  Luminaire
Sentry Electric Company, Battery Park Series
model SBP-100HPS-120V-PC-BK-V
SCP inside sandblast globe
Pedestrian Light Pole
Union Metal Corporation, Nostalgia Series
model P874-39, 14ft., 16 flute steel shaft with custom 3” tenon, color per City of Berkeley
Cast aluminum base MM39, AA-356.OF with access door in base
College/Bowditch  High/Low Fixture (style and manufacturer to be determined by COB)

Furnishings

Bench  Landscape Forms
Scarborough 6’ w/center armrest, color per City of Berkeley
Trash Receptacle  Forms + Surfaces Urban Renaissance Receptacle
part number 970270, color per City of Berkeley
Bus Shelter  Lamar Transit Advertising
AC Transit (510)981-7062
Bicycle Rack  Dero Racks Hoop Rack, galvanized
References

Environmental Impact Report for the Underhill Area Projects, Volumes I & II; April 2000

Draft Southside Plan; December 2001

Southside Plan - Planning Commission Subcommittee Draft - Zoning; July 2003

City of Berkeley Street Tree Planting Policies/Guidelines

City of Berkeley Bicycle Plan; December 31, 1998

Denver Streetscape Design Guidelines; 1993

City of Berkeley Map Room - Zoning Information
  www.ci.berkeley.ca.us/maproom/default.html

City of Berkeley Transportation Bike Plan
  www.ci.berkeley.ca.us/transportation/Bicycling/BikePlan/BikePlan.html

City of Berkeley Bicycle Boulevard Design Tools and Guidelines
  www.ci.berkeley.ca.us/transportation/Bicycling/BB/BicycleBoulevard.html

City of Berkeley Bicycle Boulevard Signage
  www.ci.berkeley.ca.us/transportation/Bicycling/B/BicycleBoulevardSignage.html