DOWNTOWN STREETS & OPEN SPACE IMPROVEMENT PLAN

DECEMBER 2012

Cover Photo: *Shattuck Avenue and BART Plaza. Staff photo.*

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EXECUTIVE SUMMARY

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The Street & Open Space Improvement Plan (SOSIP) presents a **shared vision for the future of Downtown Berkeley's public realm**. To make this shared vision a reality, the SOSIP presents strategies and implementing actions. These were developed during a year-long process guided by a multi-Commission "Subcommittee," and with the direct involvement of Berkeley citizens, UC Berkeley, individual Commissions, and staff from several City departments.

Streets, parks, and other public open spaces take up over a third of the Downtown Area and play a vital role in meeting a range of community needs. Public spaces allow us to get to and through Downtown, but also give us reasons to come to Downtown in the first place. If Downtown retail is to compete economically and remain a center for community life, its streets and open spaces need to be inviting and attractive. Furthermore, the livability of Downtown housing and employment depends on the amenities and recreational opportunities Downtown open spaces can provide.

Goals for Downtown are summarized below.

a. Placemaking. Downtown should be attractive and offer memorable experiences. The quality of the pedestrian environment should help make Downtown a destination.

Facing Page: Vital Connection. *Center Street connects BART and UC's campus and has the highest pedestrian volumes in the East Bay. In the 1990s, improvements were made along Center's southern edge, which widened the sidewalk, encouraged outdoor dining, and added street trees and pedestrian-scaled lighting. Staff photo.*

b. Public Life. Downtown should engage people of all ages in social, cultural, and business activities in Downtown, and reinforce Downtown as the "heart of Berkeley."

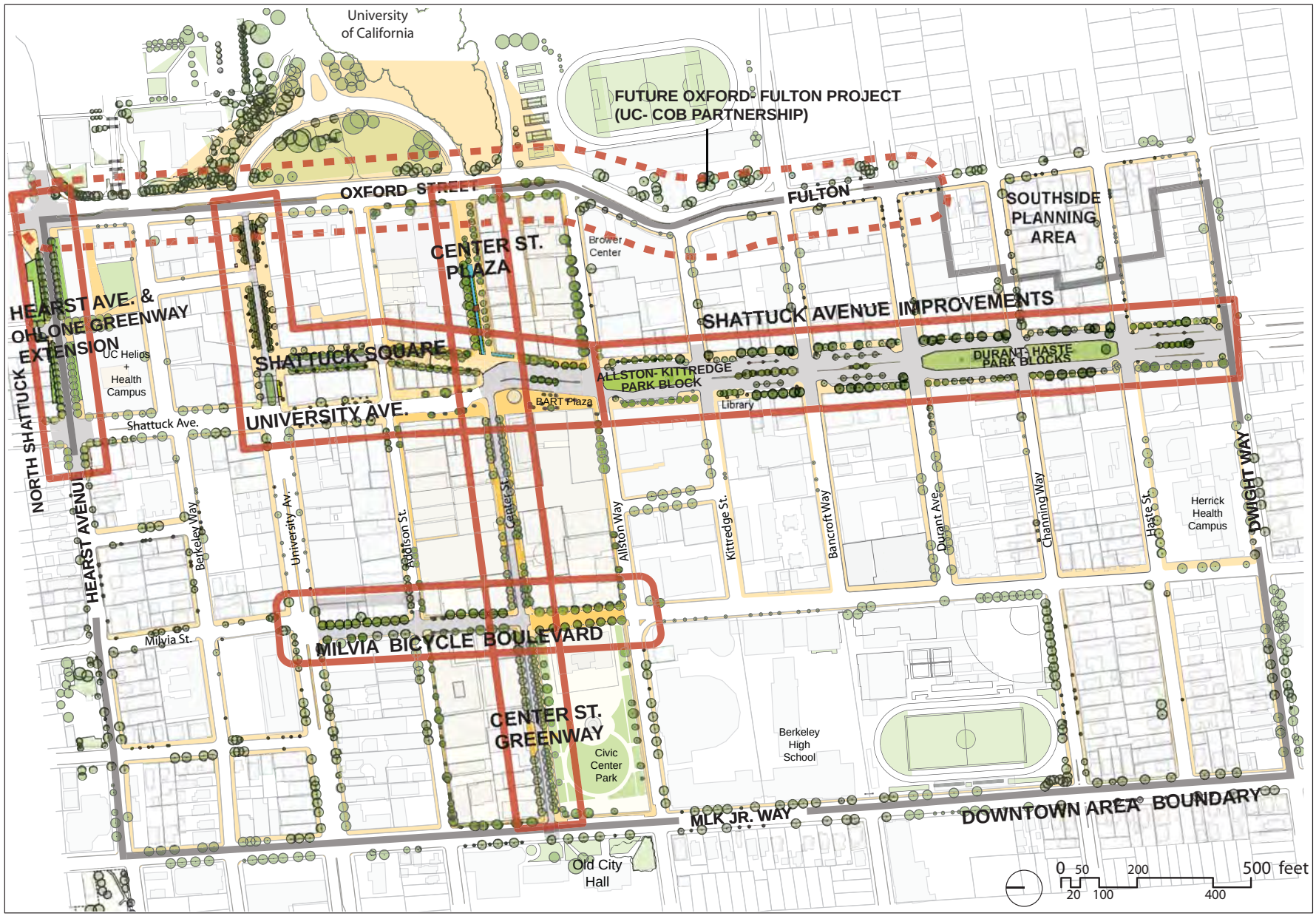
c. Health & Comfort. Make Downtown more welcoming. Provide safe and attractive facilities for pedestrians and bicyclists. Calm traffic to minimize injuries.

d. Access. Support access to Downtown by all travel modes. Improve pedestrian and bicyclist environments and facilities. Support and expand transit use. Recognize that convenient short-term parking is critical to Downtown's economic success.

e. Sustainability. Make a great and green Downtown. Minimize human impacts on – and raise awareness of -- ecosystems to which Downtown connects

Figure a.1. Access to Recreation. *Large parts of the Downtown Area are more than a few blocks from public open space.*

***Figure a.2. Major Projects**. The SOSIP will guide Major Projects and promote enhancements that can occur throughout Downtown.*



Opportunities for Major Public Improvements

While Downtown contains successful places like the Addison Street's "Poetry Walk" and Center Street's "Restaurant Row," many more public improvements need to be made. Little investment has occurred to improve public streets and open spaces since BART was built in the 1970s.

Fortunately, Downtown includes several opportunities where major new improvements can be made. Many major projects could become possible by eliminating traffic lanes and rearranging parking. While environmental impacts from such changes have been evaluated, additional analysis may be needed to affirm their feasibility and address issues through site-specific design.

Major Projects include:

a. **Shattuck Avenue & Park Blocks.** Shattuck's wide right-of-way makes dramatic transformations possible. A linear "park block" between Allston & Kittredge would provide active uses, amenities, trees and landscaping near BART and Downtown cinemas. Between Durant and Haste, park blocks would provide activities and recreational options for area residents. Sidewalks would be widened where park blocks are absent, and would be accompanied by amenities and "rain gardens" to hold and remove pollutants from the urban runoff that washes off of streets. New bike lanes would offer easy access to local destinations and enhance safety.

b. **Shattuck Square & University Avenue.** Putting through traffic on the west side of Shattuck Square would reduce congestion at University Avenue, but would also make the east side of Shattuck Square available for more on-street parking in the near term, and a plaza or slow street in the long term. On University Avenue from Shattuck to Oxford, sidewalks would be widened and accompanied by amenities and "rain gardens".

c. **Center Street Plaza & Greenway.** Between Shattuck and Oxford, Center Street has extremely high volumes of foot traffic, and it is abutted by the site of the future University Art Museum / Pacific Film Archive. This street segment would be closed to regular traffic to create a plaza for public gathering and urban amenities. A water feature would raise awareness of the natural systems to which Downtown is connected – especially Strawberry Creek which runs into a culvert a short distance away on the UC Campus.

d. **Hearst Street & Ohlone Greenway Extension.** The Ohlone Greenway provides a bicycle/pedestrian connection to Albany, El Cerrito and Richmond, and would be extended to the UC Campus with landscaping, continuous bicycle lanes, and pedestrian improvements.

Opportunities for General Enhancements

The SOSIP also makes recommendations for enhancements throughout Downtown, not just in locations where major projects are possible. Chapter topics include the following:

a. **Pedestrian Environments.** Improvements would expand areas available to pedestrians, and enhance pedestrian safety.

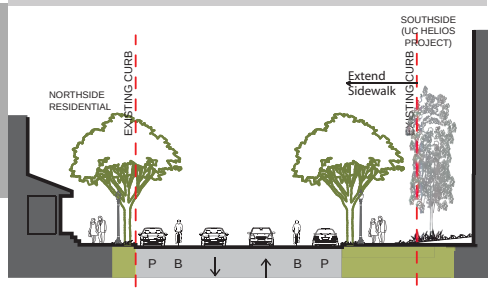
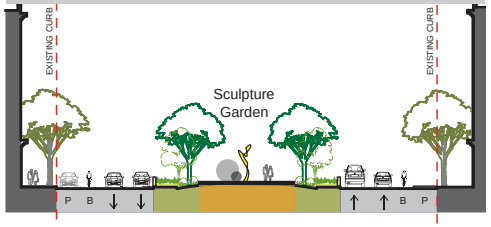


Figure a.3. Hearst Avenue.



ALLSTON- KITTREDGE PARK BLOCK

***Figure a.4. Park Blocks**. 60-foot-wide parks are proposed along parts of Shattuck Avenue. One can be a focal point for Downtown'scinema district and strengthen Downtown as a destination.*

Figure a.5. Hearst Avenue.

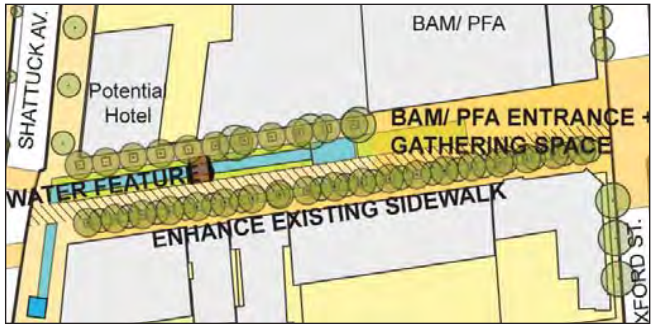


Figure a.6 Center Street Plaza.

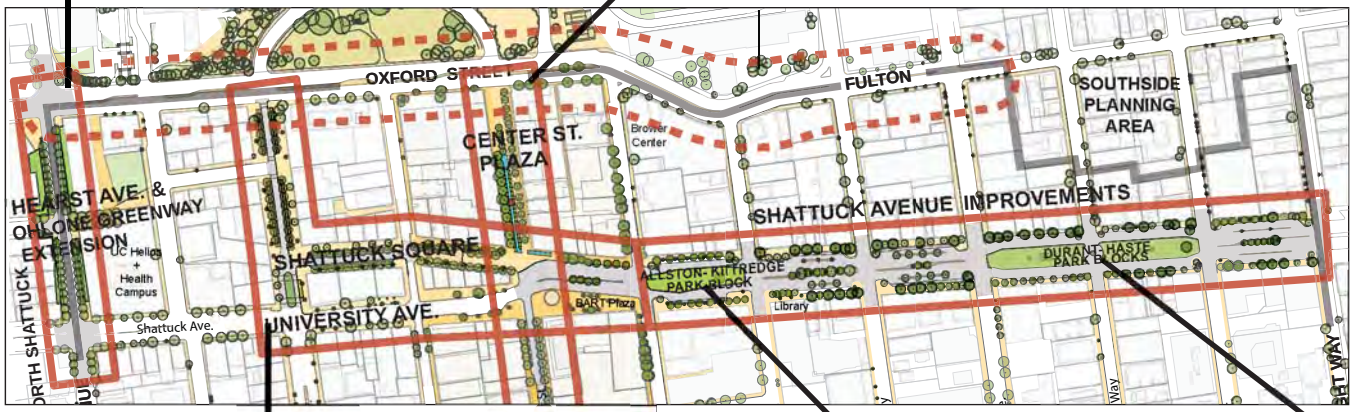


Figure a.7. Keymap.

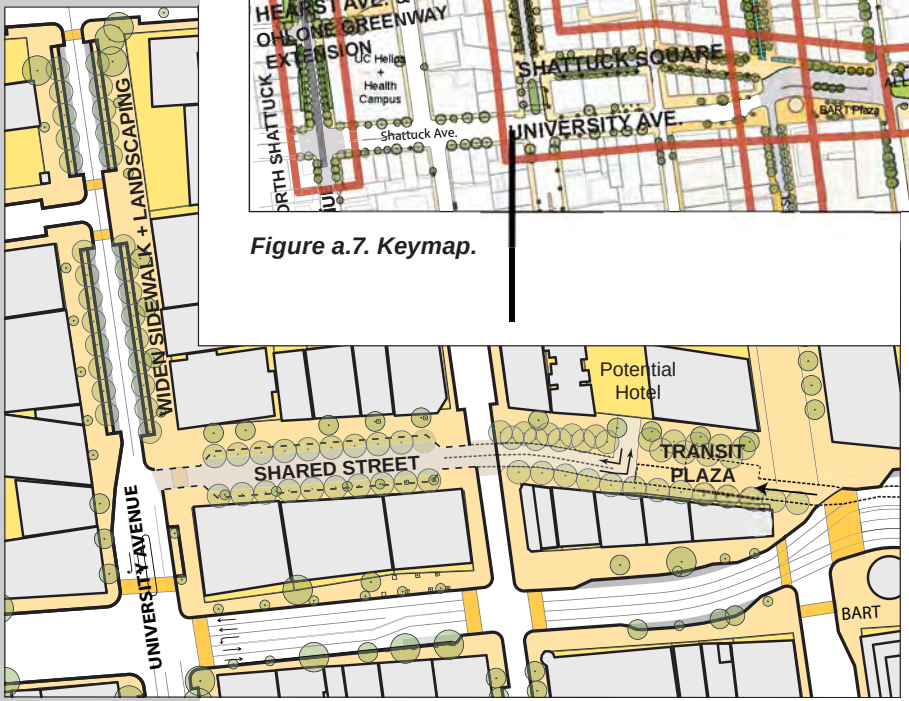


Figure a.8. Shattuck Square Plaza and University Avenue.

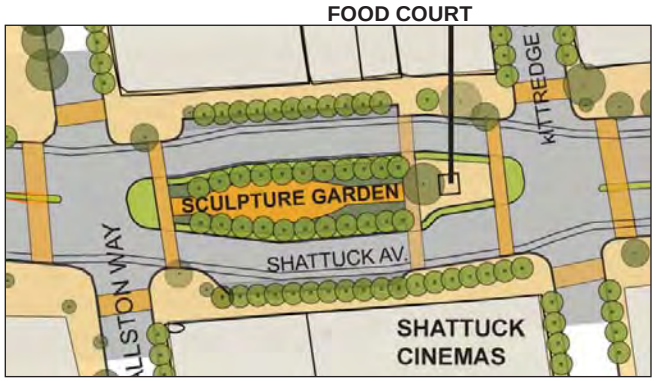


Figure a.9. Allston-Kittredge Park Block.

b. Bicycle Network & Facilities. Improvements would complete the network of bicycle lanes and routes envisioned for the area.

c. Street Trees & Landscaping. Large gaps in Downtown's tree canopy would be filled and more greenery would be promoted.

d. Furnishings & Other Street Elements. Amenities and features would support Downtown activity and promote a distinctive sense of place

e. Public Art. Art would be encouraged, not only large permanent art but also functional and commonplace art, such as artistic bike racks and decorated utility boxes.

f. Signage & Wayfinding. Visual clutter would be replaced with a consistent and more harmonious palette of signs. Signs would help people find Downtown destinations and points of interest.

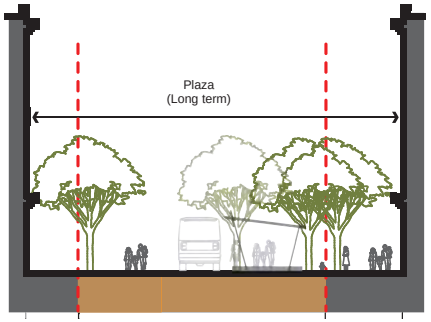
g. Lighting. Pedestrian-scaled lighting would make Downtown more inviting.

Figure a.10. Lower Shattuck Park Blocks.

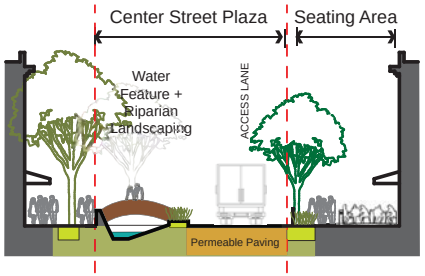
h. Watershed Management & Green Infrastructure. Bio-retention basins and other features would treat pollutants found in urban runoff before they head downstream. Green features also benefit downstream conditions by reducing peak stormwater runoff volumes and rates. Attractive features are often associated with green infrastructure, such as distinctive landscaping, special pavers, and small places where rainwater can collect.

Financing Strategy

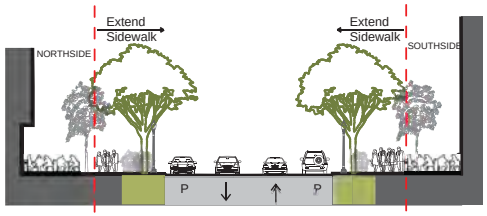
The SOSIP contains recommendations to promote its implementation and the on-going maintenance of Downtown spaces, including the identification of near-term priorities to address limited funding opportunities. A SOSIP Financing Strategy considers costs associated with capital improvements and on-going maintenance, and makes recommendations for financial resources to address these costs.



SHATTUCK SQUARE PLAZA



CENTER STREET PLAZA



UNIVERSITY AVENUE

Figure a.11. Design Concepts. *Major Projects will enhance pedestrian environments, encourage bicycling, improve watershed health and add trees and landscaping.*

BACKGROUND

BACKGROUND

PURPOSE

Through thoughtful design and careful programming, streets and open space can address complex functional challenges relating to transportation, ecological restoration, regular and occasional activities, and community life. Parks, plazas, streets, and other public open spaces should reflect the highest aspirations of a community and meet the needs of people of all ages and abilities.

The SOSIP establishes a framework for Downtown Berkeley's public realm, which is comprised of public parks, plazas, and street rights-of-way, which together comprise about 40% of the Downtown Area. The SOSIP offers a simple "playbook" that communicates a clear vision for vibrant parks, plazas, and streets that are shared by pedestrians, cyclists, and cars traveling at safe, appropriate speeds. The SOSIP also helps streamline the design and implementation process by vetting concepts before opportunities arise, coordinating agencies and stakeholders, and establishing a program for financing improvements and on-going maintenance.

SOSIP improvements will implement Berkeley's General Plan, Downtown Area Plan and Climate Action Plan. Many features in the SOSIP spring from the extensive community process that surrounded the development of the new Downtown Area Plan, which was adopted in 2012.

Facing Page: Transportation Hub & Community Life. *Downtown grew rapidly as a rail and streetcar center, as commercial and civic uses took advantage of this access.*

Figure b.1. Shattuck in the 1940s.

Figure b.2. Downtown's Farmers Market

Figure b.3. Transit & Complete Streets. *Pedestrian- and bike-oriented improvements make car-free living more possible by making transit a more attractive option and will help Berkeley attain its climate action goals.*

It is important to note that the SOSIP focuses on public spaces and not open space on private land. Design considerations for private open space are included in Berkeley's Zoning Ordinance and the Downtown Development Design Guidelines.

SETTING

Downtown Berkeley already contains notable open spaces and streets, which address many community needs. Martin Luther King Jr. Civic Center Park is Downtown's largest open space and was recently improved to emphasize its historic significance and introduce a tot lot and skateboarding area to serve Berkeley's youth. Berkeley High School's track is used for community recreation when it is not being used for School activities. BART Plaza (also known as Constitution Square) will undergo improvements to make it a more attractive, useful, and supportive of transit. "The Crescent" on the UC Campus also serves Downtown with a large grassy slope that creates an attractive formal entry to the University. Downtown also contains special streets, such as the Addison Street "Poetry Walk," and the southern side of Center Street, east of Shattuck, where generous sidewalks are lined by active building fronts and sheltered by broad tree canopies.

Street and open space improvements are needed, however, to better address community goals. In spite of Downtown being largely built-out, major street and open space improvements can be achieved. Several types of enhancements can also be made in addition to major improvements, such as by planting more street trees and installing a consistent and appropriate palette of signs, furnishings and other street elements.

Streets and open spaces meet community needs in multiple ways. Transportation needs are the most obvious. Downtown is where two of Berkeley's principle thoroughfares converge: Shattuck and University Avenues. Transit service plays a vital role in Downtown; the Downtown Berkeley BART station serves more than 24,000 entries and exits per day, and there are over 6,000 bus boarding and alightings Downtown each day. Transit will remain an attractive option if convenient, reliable, and reasonably fast.

Public spaces are also critical for making Downtown a more inclusive social center, a more attractive cultural destination, a more successful commercial center, a more livable residential neighborhood, and a more ecologically-beneficial place. Demands placed on

streets and open spaces are discussed further in following chapters.

PROCESS

The SOSIP was developed with the guidance of a Subcommittee comprised of four City Commissions, each having a direct interest in streets and open space: the Parks, Recreation & Waterfront Commission; the Public Works Commission; the Transportation Commission; and the Planning Commission. The Plan also incorporates input received from Berkeley's Civic Arts Commission, the Landmarks Preservation Commission, and the Design Review Committee. In addition, a public workshop offered community members a chance to comment on design concepts and identify community preferences.

The SOSIP's Project Manager worked with other City staff to develop policy language and design concepts for consideration. Additionally, Economic Planning Systems developed funding recommendations for the SOSIP, which were based in part on ballpark cost estimates developed by Community Design & Architecture.

The SOSIP was also reviewed by multiple City Departments to assure consistency with City policies and initiatives.

Figure b.4. The east end of Addison is still in need of improvement.

Figure b.5. University Avenue facing east.

GOALS

GOALS

Placemaking. Make Downtown a more vibrant, attractive, and memorable destination. Increase enjoyment of Downtown by favoring pedestrians. Create a more beautiful Downtown with appealing street elements, lush vegetation, and public art. Enhance cultural and aesthetic connections between Downtown and the UC Berkeley campus.

Public Life. Engage people of all ages and abilities with social, cultural, and business activities in Downtown. Meet diverse community needs, while also promoting Downtown as a visitor destination. Establish public gathering places in the heart of Downtown. Emphasize Shattuck Avenue as Berkeley's principal commercial "main street," especially near BART.

Health & Comfort. Provide safe environments for daytime and evening activities. Maintain pleasant settings that encourage walking and bicycling – important forms of physical activity. Calm traffic to minimize injuries. Increase pedestrian-scaled lighting, especially near evening destinations. Increase recreational opportunities Downtown, particularly for residents.

Facing Page: Community-Making. *Plazas can play an important role in nurturing a shared sense of community. Staff photo.*

Access:

a. Improve transportation access to Downtown for all modes, with priority given to pedestrians and bicyclists.

b. Make Downtown a welcoming pedestrian-oriented destination.

c. Promote Downtown as a regional transit center. Support reliable transit service and increase transit ridership.

d. Improve the availability of on-street parking and manage all parking more effectively.

Sustainability. Make a great and green Downtown. Help Berkeley attain Climate Action Plan goals. Minimize human impacts on – and raise awareness of – ecosystems to which Downtown connects through watershed management and green infrastructure, by increasing trees and vegetation, and by promoting alternatives to the car.

MAJOR PROJECTS

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PRINCIPAL CONSIDERATIONS

Downtown as Destination. Major projects presented in this chapter repurpose street space currently provided for automobiles, so as to enhance Downtown as a pedestrian-oriented and bike-friendly place. Many streets in Downtown were designed when a chief concern was the speed and convenience of motorists. Some streets have more traffic lanes than are needed, and some have parking layouts that are inefficient. Major public enhancements are possible where traffic lanes can be eliminated. Inefficient parking arrangements present similar opportunities.

Attractive public spaces are an essential ingredient of livable urban communities. While Downtown contains a few beautiful places, such as the Addison Street "Poetry Walk," many Downtown streets provide only narrow sidewalks, little landscaping and few amenities. Public improvements are critical for economic revitalization, as an attractive "sense of place" can help differentiate Downtown among competing destinations.

Great & Green. The Downtown Area offers numerous opportunities for more landscaping. Over one quarter of Downtown's streets lack street trees, including streets within Major Project areas (for general strategies see Street Trees & Landscaping). Major Projects also present numerous opportunities to enhance the watersheds to which Downtown is connected. Public improvements can include "green infrastructure" that retain water and treat pollutants contained in "urban runoff." (For more discussion see Watershed Management & Green infrastructure.)

Access & Safety. Downtown improvements can also help complete Berkeley's bicycle network, make bike access to Downtown destinations more convenient, and promote bicycle safety. Pedestrian safety would also improve by reducing pedestrian crosswalk distances and calming traffic so that fewer vehicles exceed posted speed limits. Nighttime safety for pedestrians can also be improved by expanding pedestrian-scaled lighting along sidewalks, especially where they extend from evening destinations, parking facilities, BART, and bus stops.

Downtown Berkeley is the second largest transit hub in the East Bay, and Downtown's success depends in part on transit service that is reliable and attractive. Public transportation also becomes a more effective alternative to the car when pedestrian routes to transit are convenient, attractive, secure, and accompanied by interesting sights and welcome activities.

Design & Programming. Downtown spaces will need to be carefully designed and well programmed. Doing so will yield wanted results, maximize benefits, and discourage unwanted behavior and excessive costs.

Consistency & Context. Note that these chapters provide for a consistent vocabulary of street elements (street lights, furnishings, trees, etc.) with a traditional character. Consistent elements will help make Downtown a recognizable destination and harmonize the Downtown aesthetically. Elements with a traditional style are already used in the Downtown and their continued use will help highlight Downtown's history and historic resources.

Phasing. Streets and open space improvements are expensive propositions and fund-

Figure d.1. Downtown as Destination. *Public improvements in the Downtown will transform Downtown's "sense of place," as is illustrated in this photomontage of proposed sidewalk widening along University Avenue.*

Facing Page: History of Remaking. *Shattuck Avenue has undergone several major transformations. Shattuck's existing configuration was established in the 1970s. Shown is Shattuck at Allston during the 1950s.*

Figure d.2. Major Project Subareas.

ing sources are limited. This chapter presents near-term priorities for projects, and the criteria used. Near-term priorities are further discussed in SOSIP Financing Plan chapter.

POLICIES AND ACTIONS

Policy 1.1, Maintain a Consistent Palette of Street Elements Throughout Downtown.

Features that are used consistently should have a traditional character compatible with Downtown's historic assets. For related policies see: Policy 5.2 for street trees, Policy 6.3 for furnishings & street elements, Policy 7.3 for public art, Policy 8.2 for signage, and Policy 9.3 for lighting. Exceptions should be allowed to highlight major designated landmarked structures.

Policy 1.2, Major Project Opportunities. Promote beneficial street and open space improvements in the Downtown by identifying desired objectives that address principle considerations, can be implemented, and have broad-based community support.

a. **Design Concepts.** Refer to illustrative design schematics that address these objectives. These illustrative plans will be refined as additional programming[1], technical analysis and community outreach occurs. Project-specific objectives and attributes are described in policies below and are illustrated in the following figures.

Policy 1.3, Near-Term Priorities. The City should focus its limited financial and staff resources on Near-Term Priorities identified below, while also capitalizing on grant and developer-based opportunities. Near-term projects should meet the following objectives:

a. Reinforce commercial activity along Downtown's principal commercial corridors, Shattuck Avenue & University Avenue, and especially near BART.

b. Make Downtown safer and more attractive for pedestrians and bicyclists.

c. Promote Downtown as a unique and memorable destination.

d. Create at least one public space that is suitable for public gatherings near the center of Downtown.

e. Emphasize types of projects that would be most competitive for grant and private funding.

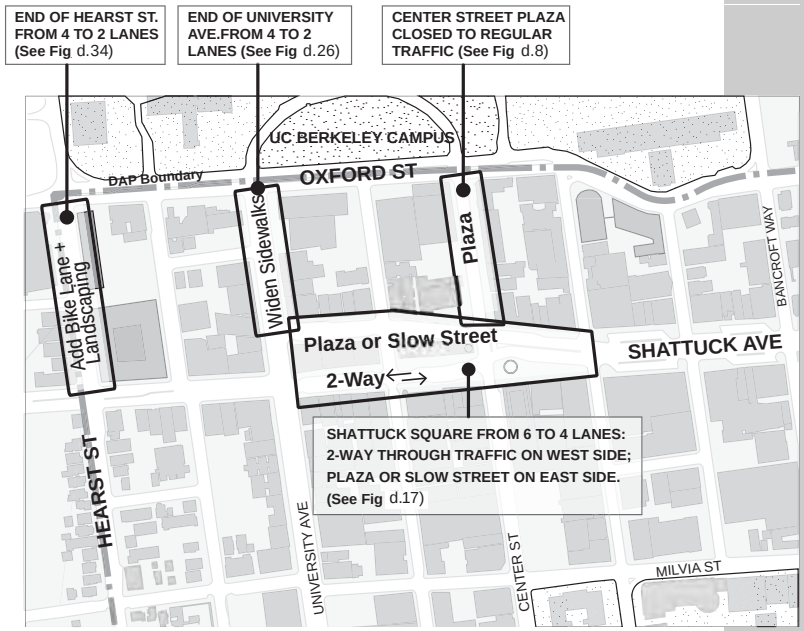


Figure d.3. Travel Lanes & Major Project Opportunities. *Places where travel lanes can be eliminated or reconfigured present important opportunities for sidewalk windening, green infrastructure, bikel lanes, and other improvements.*

[1] *"Programming" identifies functions, activities, and features that may be required or desired.*

Figure d.4. Near-Term Priorities.

f. Locate improvements adjacent to development projects to help fund these improvements, and take advantage of synergies between development and public improvements.

g. In the near term, replace on-street parking that would be lost with public improvements with additional nearby on-street parking.

h. Fund multiple projects. Avoid using limited funds on a single project.

Using these criteria, the following projects have been identified as funding priorities. Note however that these priorities do not preclude the City from moving forward on other SOSIP projects if opportunities for grants or developer contributions emerge.

Highest Priorities (Tier I)

a. Center Street Plaza Phase 1. Center Street offers a unique opportunity to create a public gathering space activated by high pedestrian volumes, existing commercial uses, and the future Berkeley Art Museum / Pacific Film Archive. Phase 1 will be constructed on the east end of the block, above where access to the Bank of America parking lot needs to be maintained. Green infrastructure features, such as permeable paving and rain gardens (bio-retention basins), could be incorporated into Phase 1 to demonstrate green infrastructure and make a unique destination. While a water feature that refers to Strawberry Creek appears to be technically infeasible in Phase 1, piping might be put in place below Phase 1 improvements to avoid excavation and additional costs later.

b. Shattuck Square and University Avenue Gateway. Reconfigure Shattuck to make traffic operate two-way on the west side of Shattuck Square and provide additional on-street parking on the eastern leg of Shattuck. This improvement will help implement the Plan's zero-net parking strategy and should be precede other improvements if possible. Establish a transit center on the east side of Shattuck Square if it is determined that this is the preferred location Downtown. On University Avenue between Shattuck and Oxford, travel lanes can be eliminated to allow wider sidewalks and additional landscaping and other amenities. One alternative would also increase on-street parking.

c. Street Trees. The City should make the planting of street trees a near-term priority, with a goal of planting 500 new trees within ten years in locations where "major projects" are not anticipated. (See Policy 5.1)

High Priorities (Tier II)

a. Allston-Kittredge Park Block and east end of University Avenue. These projects will support commercial revitalization along Downtown's principal commercial corridors by adding activity and new synergies with existing uses (e.g. cinemas) and future uses.

a. Hearst Avenue / Ohlone Greenway Phase 1. Greenway improvements will provide continuous bicycle lanes from MLK to the UC campus. To avoid construction conflicts when UC develops below Walnut, improvements should first be made to the Walnut intersection and above. Diagonal parking might be provided on Hearst in the near-term near Shattuck.

Other Priorities (Tier III)

a. Milvia Bike Lanes. Create bicycle lanes on Milvia between University and Allston to enhance bicycle safety and comfort along this Bicycle Boulevard.

b. Shattuck Avenue Bike Lanes. If current traffic lanes widths are reduced, bicycle lanes become a priority on Shattuck in light of its high concentration of destinations, high bicycle volumes, and potential conflicts with cars, buses and trucks.

Policy 1.4, Parklets & Other Temporary Improvements. Priority should also be given to creative and low-cost ways to use public rights-of-way to promote pedestrian-oriented activities.

a. Consider closing streets and/or travel lanes for short periods when traffic is light to host a street fair, project a movie on a building, showcase art, or create temporary "parklets."

b. Work with Downtown merchants to identify suitable locations for "parklets" where a few on-street parking spaces are cordoned off and become a space for seating, temporary art, or other special amenities.

c. Use temporary closures to evaluate how permanent lane eliminations or street closures might perform, with immediate consideration of Center Street where a plaza is planned.

d. Review and, if needed, amend existing standards and procedures to remove barriers to temporary improvements, like parklets.

Policy 1.5, Analysis & Design. Dimensions of travel lanes and other features that are noted in SOSIP graphics and narrative are subject to further analysis and refinement.

Major Project concepts should be developed as resources become available. During design development, analyze each site and its surrounding context to identify opportunities (such as the location of historic assets), constraints (such as the alignment of below-grade infrastructure), and conditions that pose security concerns (such as paths to parking garages). Interested stakeholders and Commissions should be consulted. Staff review should consider safety, maintenance, and accessibility.

a. Potential Impacts & Design Development. SOSIP design concepts illustrate dimensions and arrangement that balance competing demands but with a special emphasis on the quality of pedestrian environments. Evaluate potential impacts to traffic and transit operations, along with benefits to pedestrians and bicyclists. Use such evaluations to adjust dimensions and design features to better address transportation and SOSIP objectives.

b. Travel Lane Reductions. Reallocate parts of public rights-of-way that give unnecessary capacity to motor vehicles -- and can be repurposed to yield significant pedestrian, bicycle, and/or ecological benefits. Eliminate travel lanes only after traffic modeling and environmental analysis have determined that pedestrian/bicycle safety, transit operations, and traffic considerations have been adequately addressed. The Downtown Area Plan environmental analysis has indicated that the following

proposed lane reductions appear to be feasible:

- Shattuck Avenue and Shattuck Square between University Avenue and Allston
- on University Avenue between Shattuck Square and Oxford; on Hearst Avenue between Shattuck and Oxford; and
- closing Center Street to regular traffic between Shattuck and Oxford (see Figures d.7-d.9) .[2]
- Address site-specific and operational concerns through additional analysis as needed.

c. Parking Lanes. Parking may be reconfigured to make desired improvements as needed. On-street parking that is lost should be replaced by adding on-street nearby, to the extent feasible. There should be no net loss of on-street parking, until it has been determined that Downtown parking availability is being adequately addressed through parking and transportation demand programs (see also Policy 1.18, Net-Zero Parking). Consider the needs of persons with disabilities when parking locations are altered.

d. Related Documents. Users of this Plan should also refer to the Municipal Code, Pedestrian Master Plan, Bicycle Master Plan, and Transportation Element of the General Plan. If a provision of this Plan conflicts with one of these documents, the other document shall govern unless and until it is amended by Council.

Policy 1.6, Center Street Plaza & Greenway (Figures d.7-d.9 and d.12-d.15). The Center Street Plaza & Greenway project should ultimately create a continuous green corridor and pedestrian connection between Civic Center Park, BART and the UC campus. The project is made up of segments that can be implemented separately: Center Street "Plaza" between Shattuck and Oxford (itself divided into two phases as described below), "Greenway" landscaping between Milvia and Shattuck, and "Greenway" landscaping with the possible daylighting of Strawberry Creek where it runs below Civic Center Park.

Center Street Plaza (between Shattuck & Oxford). The Center Street Plaza site connects BART to the University of California. This block has the highest density of foot trips in the East Bay. The south side of the Plaza site is lined by the thriving "Restaurant Row" businesses that are supported by sidewalk amenities and street trees that were installed in the 1990s. To the north, the Plaza site abuts the site of the University's new Berkeley Art Museum / Pacific Film Archive (BAM/PFA). Just west of BAM/PFA is the Bank of America site, which many consider to be ideal for a future hotel. The Center Street Plaza is conceived of as "the future heart of Berkeley" that will bring more vitality to Downtown's "Core Area" that immediately abuts BART. The schematic concept for Center Street Plaza illustrates the following objectives:

a. Maintain a convenient, attractive, and reasonably direct path for pedestrians between BART and the UC -- and between the north and south side of the plaza;

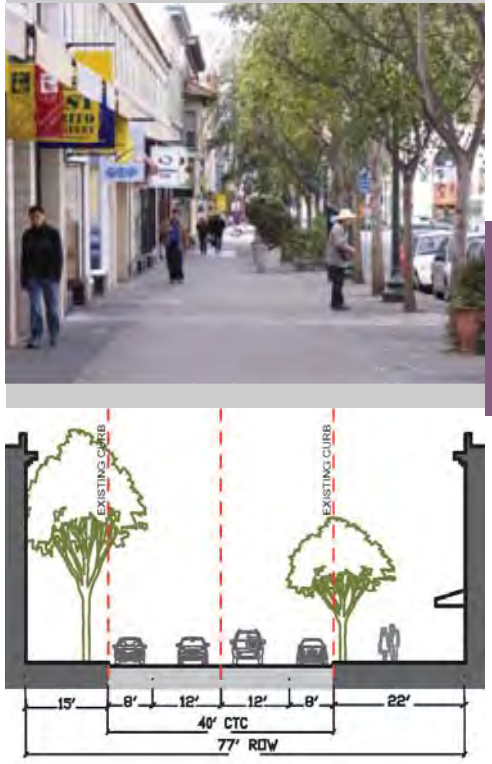


Figure d.5. Center Street Plaza (Shattuck to Oxford). *Successful street improvements along Center would be retained (photo & existing conditions section above).*

[2] *The 2009 Environmental Impact Report (EIR) for the Downtown Area Plan analyzed the lane eliminations that form the basis for Major Projects and found them to be feasible even when high levels of development are factored.*

Figure d.6. Center Street Plaza & Greenway.

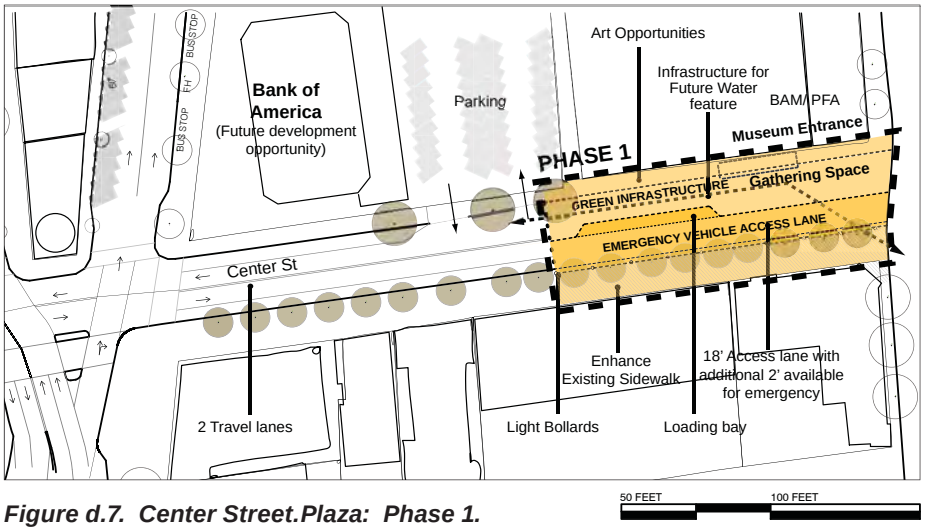
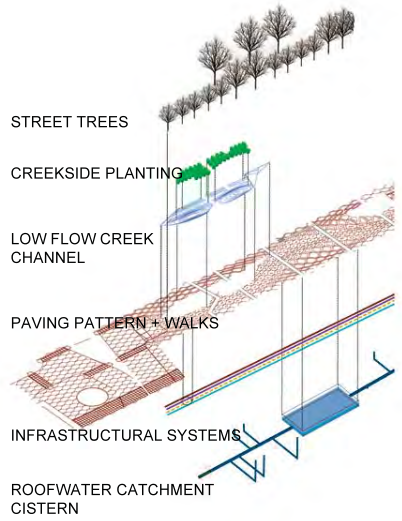


Figure d.7. Center Street.Plaza: Phase 1.



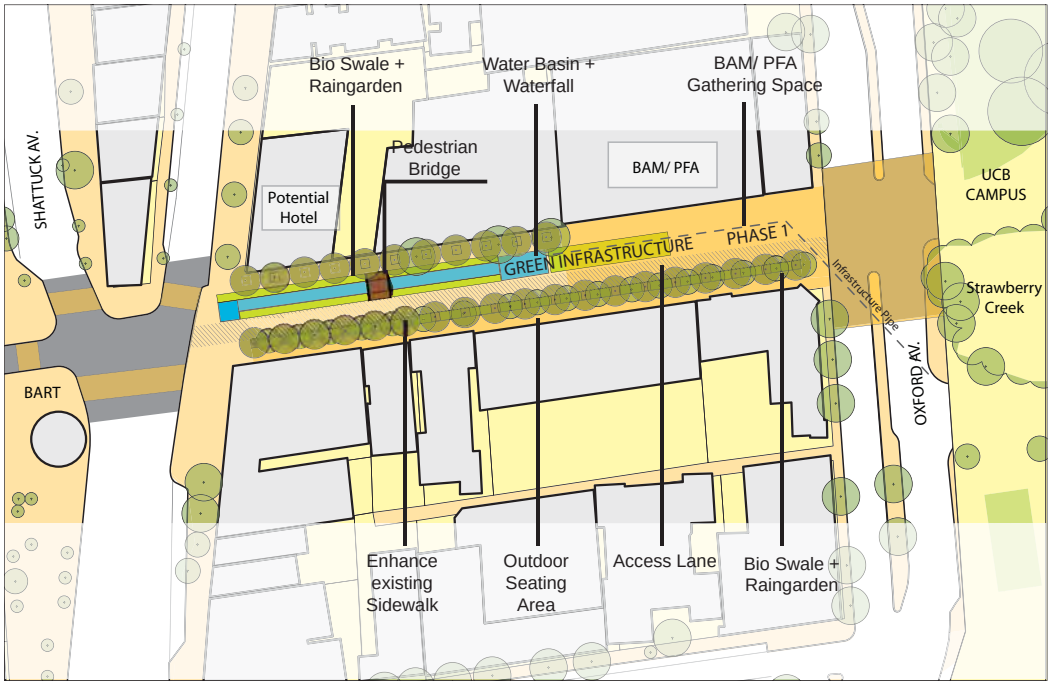


Figure d.8. Center Street Plaza: Ultimate Condition.

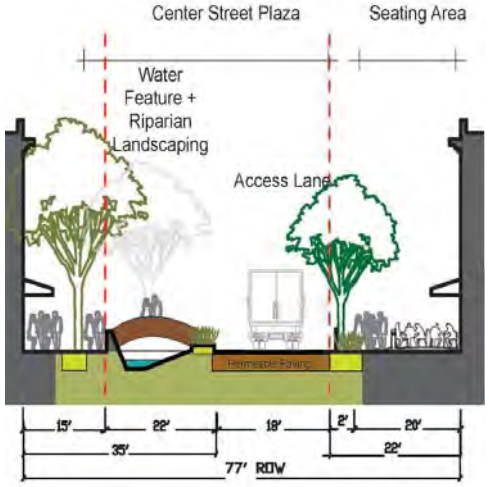


Figure d.9. Center Street Plaza (Shattuck to Oxford). *Near-term improvements would add public gathering space, and long-term improvements would include a water feature associated with Strawberry Creek (proposed cross-section above), as has been proposed by Walter Hood and EcoCity Builders (rendering above).*

Figure d.10. Center Street between Oxford and Shattuck.

b. Establish a public gathering place in front of the future entrance to the Berkeley Art Museum / Pacific Film Archive (BAM/PFA);

c. Reveal green infrastructure for education and enjoyment;

d. Create a water feature to raise awareness of Strawberry Creek (which enters a culvert just east of Oxford on the UC campus);

e. Install permeable paving and landscaping with below-grade bio-retention functions; the use of pavers should be accompanied by a concrete path of travel for wheelchair users unless pavers are proven to create no acceptable levels of wheelchair vibration;

f. Provide for slow-speed bicycle access through the Plaza; and

g. Close this portion of Center Street to regular automobile traffic for pedestrian comfort and to maximize its unique features, while providing access for emergency vehicles and commercial deliveries.

Closing Center Street to bus traffic will require the realignment of multiple bus routes and layover locations. Consequently, AC Transit and shuttle bus operators should be engaged as design development commences to determine how convenient, reliable, and reasonably fast transit service should be maintained.

Walter Hood, a landscape architect hired by the environmental organization EcoCity Builders, presented design concepts for Center Street Plaza, which he called “Strawberry Creek Plaza”, to illustrate what might be possible. Berkeley’s City Council supported these concepts, the fundamental objectives of which are recommended by the SOSIP. Additional technical analysis and community process will be needed to develop concepts further.

The Plaza’s possible water features will be a primary study item. While the Hood scheme showed water being diverted from Strawberry Creek, an alternative that re-circulates water should also be considered as it could reduce costs associated with infrastructure and ongoing operations.

While the design intent for the whole of the Plaza should be determined, detailed design should focus on an initial phase (Figure d.7). A multi-phase project is needed because vehicle access to the Bank of America parking lot must be maintained until the site is redeveloped. Even if this obstacle could be overcome, phasing of the project is likely to ease financing and expedite implementation.

Phase 1 objectives include the following:

a. Establish the public gathering place in front of BAM/PFA. Use permeable pavers that are underlain by stormwater retention and treatment features to the extent possible. Consider below-grade cisterns to capture rainwater that runs off of the Museum and can be reused to irrigate Plaza landscaping.

b. Maintain the existing southside sidewalk and street trees to reduce upfront costs and minimize construction impacts that put existing businesses at risk. Consider ways to enhance the sidewalk to have aesthetic continuity with the rest of the Plaza.

c. Provide for emergency vehicle access that maintains a minimum clear distance of 20

Figure d.11. Shared Street. *Shared streets present themselves as pedestrian-oriented plazas, where cars and bicycles yield, and all travel modes can safely mix.*

ALTERNATIVE FEATURES	CONSIDERATIONS
Maximum Parking with Bike Lanes (Existing) • Maintain bike lanes • Maintain parking lanes and consider permeable pavement • Add landscaping behind existing curb	• Avoids potential impacts on parking and bicycle safety • Landscaping would be limited and making a recognizable greenway may be challenging • Water elements limited to occasional rain gardens
Bike Lanes with Modest Greenway • Maintain bike lanes • Remove north parking lane & maintain south parking lane • Add 11-foot landscaped swale	• Avoids potential impacts on bicycle safety • Provides a recognizable greenway with a swale with water during large rain events • Eliminates parking but maintains lane used for taxi stand and Berkeley City College drop-off
Shared Street with Greenway • Remove bike lanes • Add traffic calming and/or shared street features • Remove north parking & maintain south parking lane • Add 16-foot landscaped swale	• Safety impacts to bicyclists could result from removal of bicycle lanes • Safety impacts to pedestrians could result from more bicyclists riding on sidewalks • These impacts ***might*** be adequately mitigated by slowing motor vehicle speeds through the use of shared street features for traffic calming (subject to analysis & design) • Provides recognizable greenway that would be wide enough to also include seating and related program elements • Eliminates parking but maintains lane used for taxi stand and Berkeley City College drop-off

Table d.1. Alternatives for Center Street Greenway (Milvia to Shattuck).

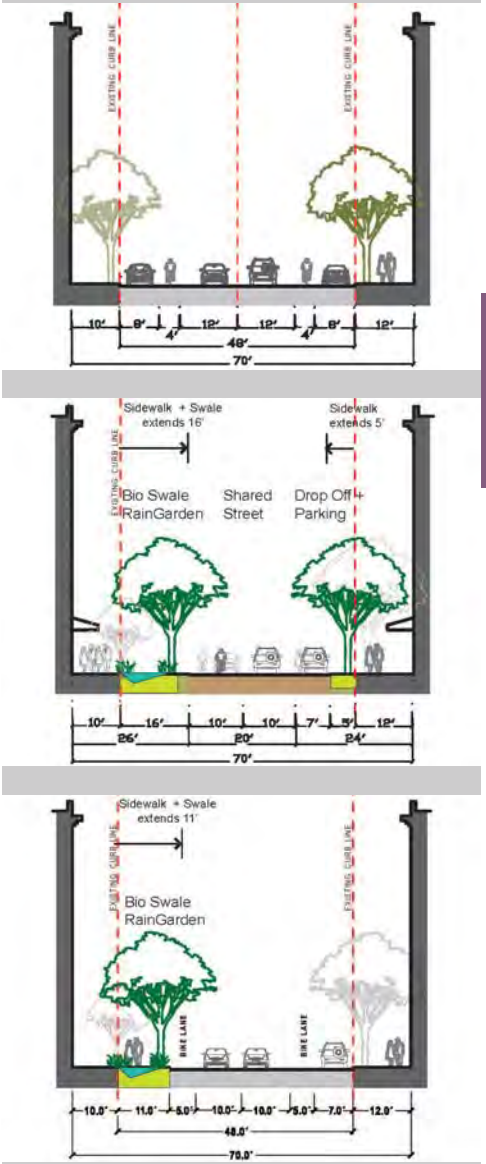


Figure d.12. Center Street Greenway (Milvia to Shattuck). *A landscaped "greenway" would create a landscaped connection between the UC campus and Civic Center Park. Existing conditions depicted at top. See Table d.1 for a description of alternatives depicted above.*

feet, unless less is required. Consider extending the southern edge fire lane to existing tree guards (as the plaza is assumed to be same elevation as the existing sidewalk) and using cobblestones (or other pavers having a natural appearance) along the northern and southern edges, so that the aisle used for everyday vehicle use does not exceed 12 feet. Cobblestones must be accompanied by wheelchair-accessible crossings.

d. Provide a small loading and drop-off bay for adjacent businesses, which could be filled with moveable seating during most hours. Consider use of cobblestones or other pavers with a natural appearance. Provide wheelchair accessibility as part of the drop-off area as required.

e. Maintain a sidewalk along the frontage of the BAM/PFA, but limit its width to what is functionally necessary and not less than 6 feet. The width and character of this path should be coordinated with the design of BAM/PFA. Consider cobblestones or other pavers with a natural appearance where the path abuts landscaping.

f. Consider a swale, green infrastructure, and/ or landscaping in the vicinity of the anticipated BAM/ PFA entrance, but where it won't conflict with access and gathering requirements.

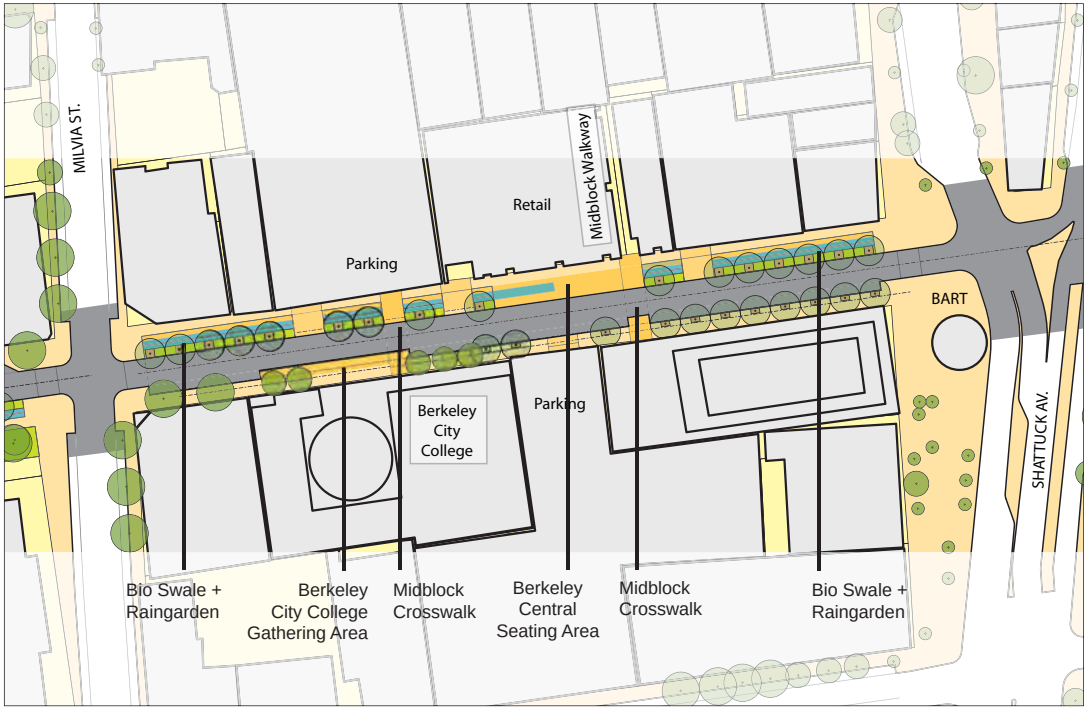


Figure d.13. Center Street Greenway (Milvia to Shattuck).

g. Consider pedestrian and aesthetic enhancements that extend across Oxford toward where Strawberry Creek enters a culvert. Work with the University to enhance public awareness of Strawberry Creek on the UC Campus, and support the University's efforts to protect and restore its riparian habitat.

Center Street Greenway (between Milvia & Shattuck). Center Street could create a visual and ceremonial connection between two important open spaces: Civic Center Park and Strawberry Creek on the UC Berkeley campus. Improvements could also support pedestrian activity generated by Berkeley City College and new commercial uses on the north side of the street. A midblock pedestrian passage through the Arpeggio building connects this block of Center Street to cultural uses on Addison Street. Because this street segment is an important bicycle facility, illustrations appear in the chapter on Bicycle Network & Facilities.

Design objectives for this street segment include:

a. As an affordable near-term improvement, plant additional street trees and add pedestrian-scaled lighting along Center Street from Shattuck to MLK. Where possible, remove existing cobrahead light fixtures.

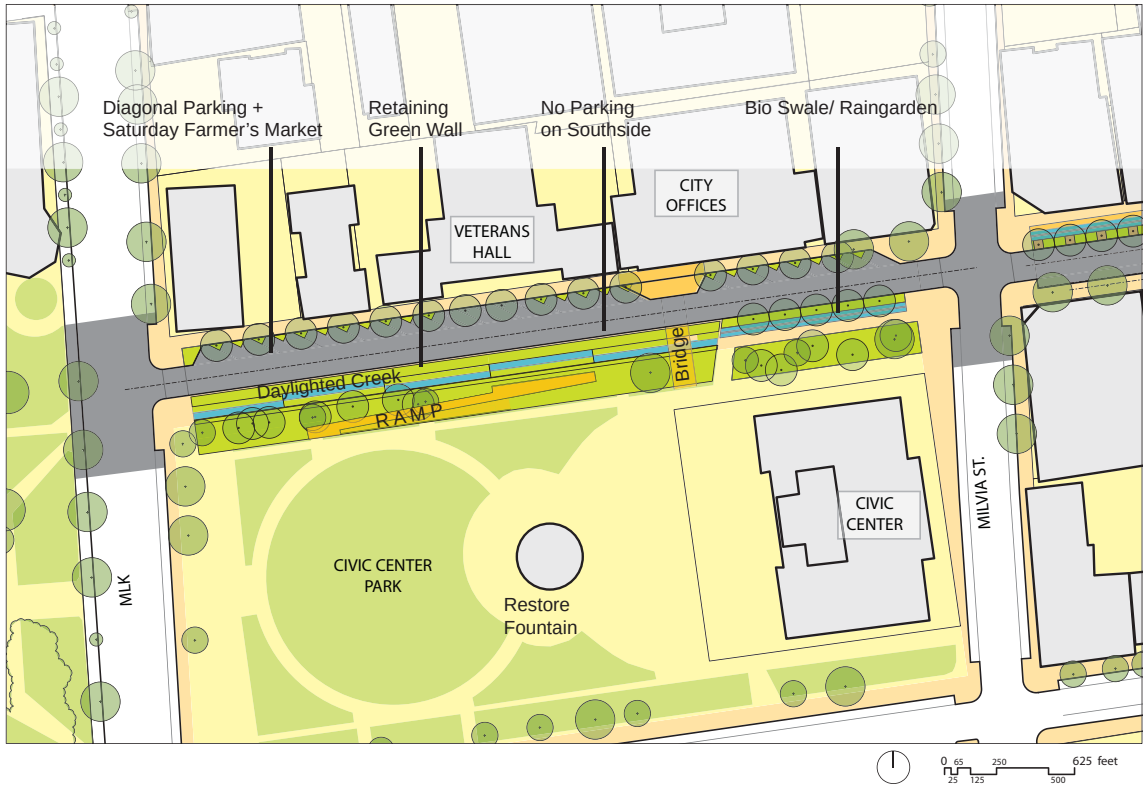


Figure d.14. Center Street Greenway (MLK to Milvia).

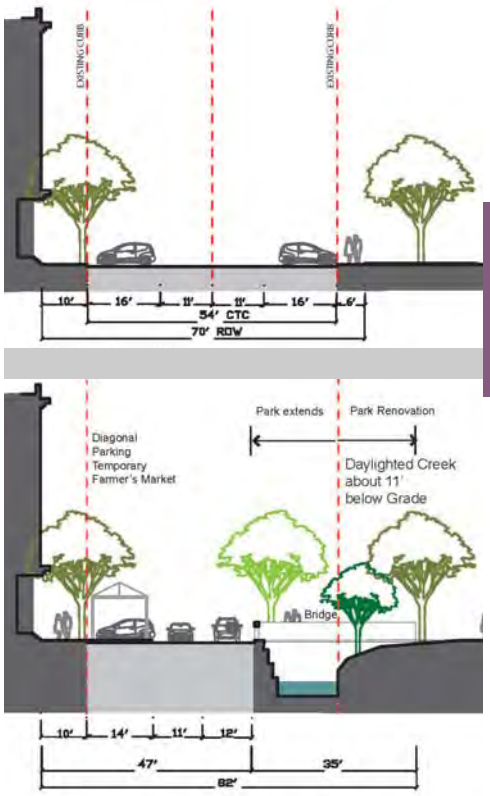


Figure d.15. Center Street Greenway (along Civic Center Park). *Center Street might be narrowed to create place-making amenities, such as the daylighting of Strawberry Creek which presently runs in a culvert along the north edge of Civic Center Park.*

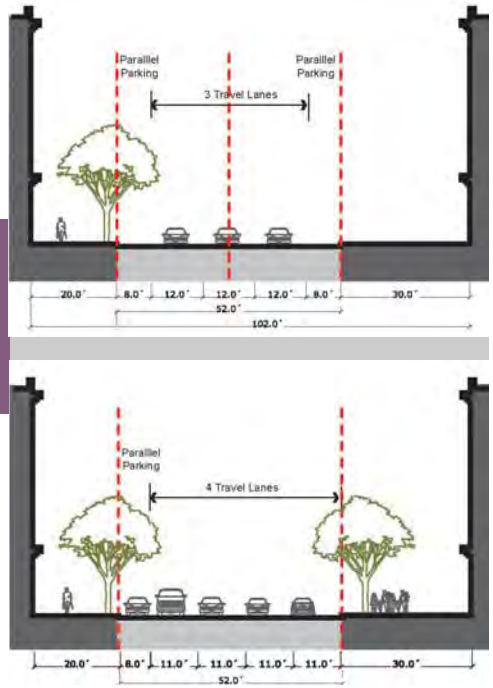


Figure d.16. West side of Shattuck Square. *Six traffic lanes have passed along Shattuck Square, with three lanes running along the west side of the Square (first section above). Analysis indicates that four lanes are sufficient. By moving all four lanes to the west side of Shattuck Square (second section below), the east side of Shattuck Square will be available for more parking (in the near term) and more pedestrian amenities (in the long term). Reconfiguring traffic should also increase safety and reduce congestion at the University-Shattuck intersection.*

b. Establish a green visual connection between Civic Center Park and Center Street Plaza (and the UC Campus and Strawberry Creek beyond), while simultaneously maintaining safety for bicyclists and enhancing safety for pedestrians. Evaluate alternatives for accomplishing these principal objectives. Specifically, consider the relative safety and performance of:

- keeping Center as presently configured with bicycle lanes and parking on both sides;
- creating a landscaped greenway by eliminating parking on the north side of the street (but keeping bicycle lanes); or
- creating a landscaped greenway and "shared street" where motorists, bicyclists and pedestrians can mix while maintaining or improving safety – even with the removal of bicycle lanes.

c. Use landscaping and pedestrian-scaled lighting to establish the Greenway. Plant more street trees, and consider creating a landscaped "bio-swale" to capture run-off from Center Street, the Shattuck Square area, and potentially including runoff from abutting buildings. Consider the potential swale in the context of other needs, including bicycle safety and parking. Removal of bicycle lanes on Center Street should only be pursued if it will not decrease safety for bicyclists and pedestrians.

d. If a swale can be accommodated, place it along the north side of Center to take maximum advantage of sunshine and avoid

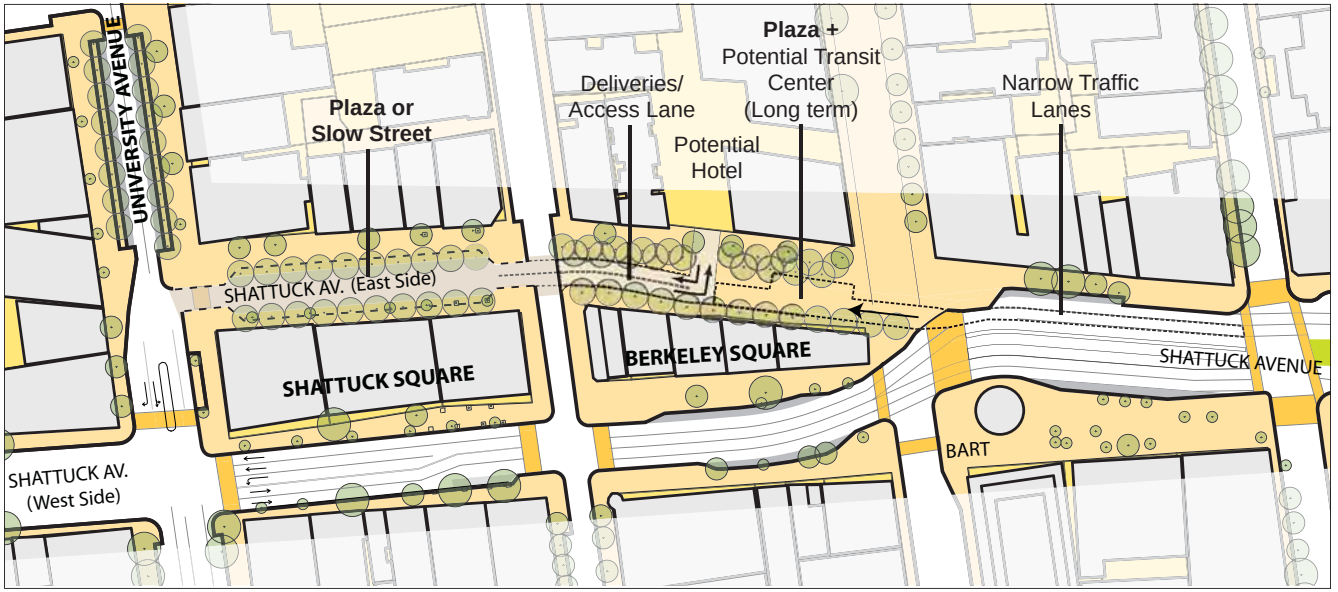


Figure d.17. Shattuck Square - Long Term. *Over the long term, the east side of Shattuck and Berkeley squares can be pedestrianized. Transit operations and improvements could be incorporated.*

conflicts with passengers being dropped off at BCC, Consider widening the sidewalk on the south side of the street because of heavy pedestrian activity, and use this widening as an opportunity to plant additional street trees.

e. Use check dams with swales to slow water when the swale fills and to create cascading pools during heavy rains. Consider how to include accessible educational and recreational opportunities.

f. Consider curb extensions in front of the entrance to Berkeley City College and where the midblock passage to Addison meets Center Street.

g. Maintain features that are consistent with the design of the Center Street Plaza (between Oxford and Shattuck).

h. Provide for taxi stand near BART as part of the Center Street Greenway design process

Center Street Greenway (Civic Center Park). Civic Center Park gets considerable use, such as during Saturday Farmers Markets, but its proximity to Downtown's heart is difficult to perceive. The Park also offers a unique opportunity to daylight Strawberry Creek, as the Creek runs below the Park. In addition, government services, the YMCA's Teen Center, and the Veterans Museum might be supported by public improvements.

a. Use trees, landscaping and other features to maintain design consistency with Center Street Plaza and the portion of Greenway above Milvia, while also complementing the character of the Civic Center Historic District.

b. Consider the feasibility of daylighting Strawberry Creek as an urban amenity and for ecological benefits.

c. Continue to seek funding to restore the fountain in Civic Center Park, and provide for its on-going maintenance.

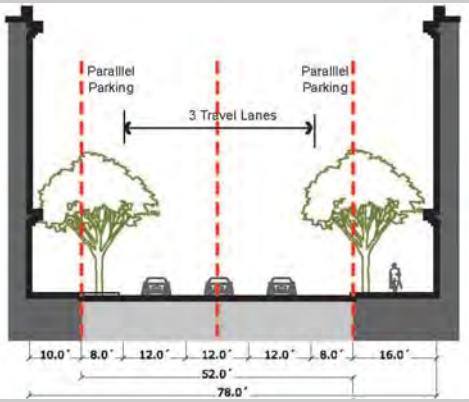
d. Consider ways to support abutting uses and the Saturday Farmers Market through public improvements.

e. Consider cisterns to store and reuse rainwater.

Policy 1.7, Shattuck Square & University Avenue (Figures d.14-d.19). Presently traffic along Shattuck Square runs north on its east side and south on its west side.[3] This configuration makes northbound traffic follow an S-curve at it moves from Shattuck Square's east side to Shattuck Avenue north of University. Traffic volumes and speeds along this S-curve movement have contributed to high pedestrian collision rates at the University-Shattuck intersection. Two-way traffic is proposed on the west side to address this issue, and to increase traffic capacity at the University-Shattuck intersection.

Two-way traffic on the west side also makes the east side available for more parking in the near term and more pedestrian amenities in the long term. In addition, AC Transit considers the east side of Berkeley Square as a potential near term location for a new "transit center."

[3] *While the "westside of Shattuck Square" is actually named "Berkeley Square," most readers will find the eastside/ westside nomenclature easier to understand.*



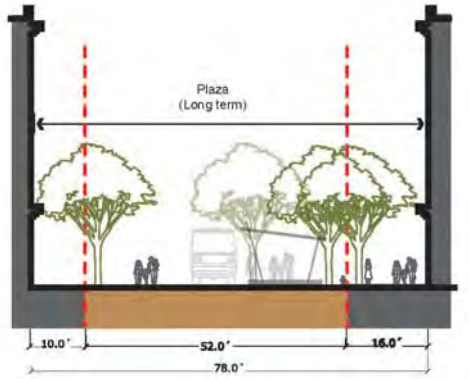
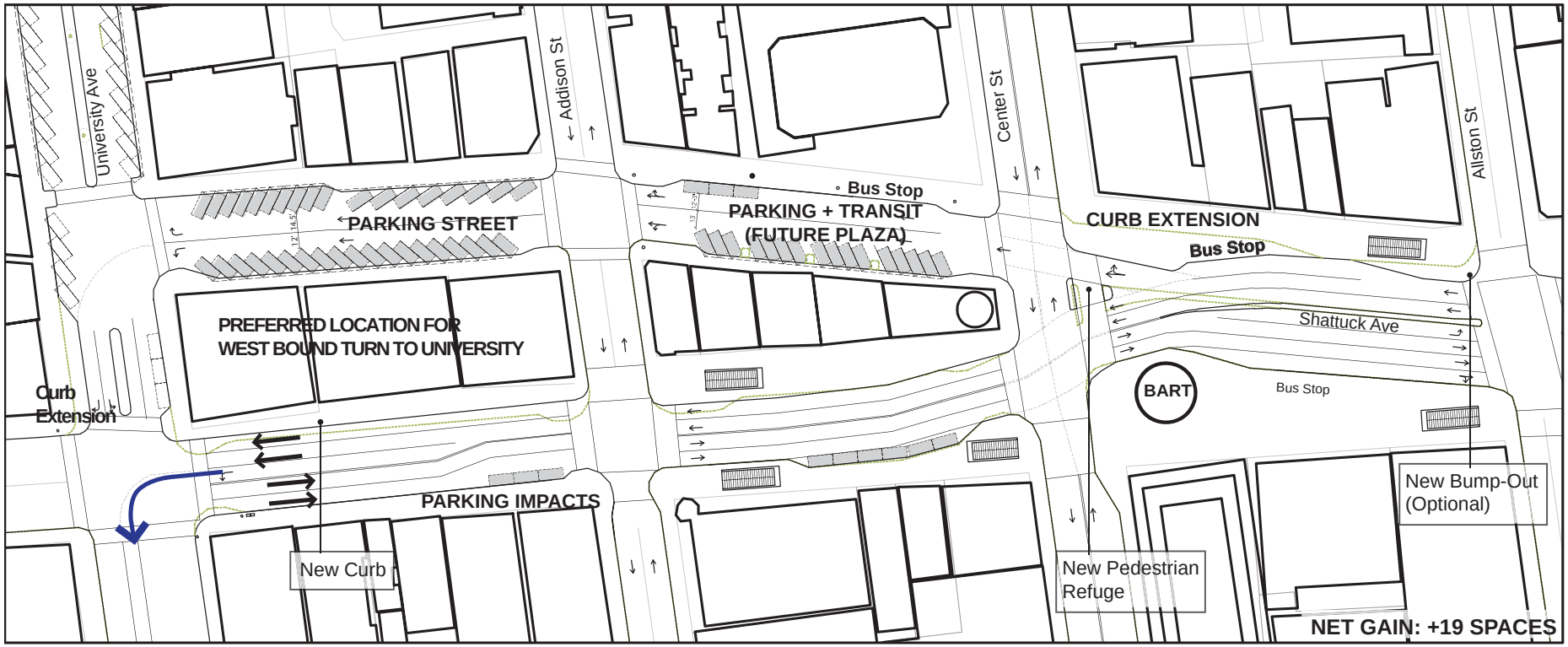
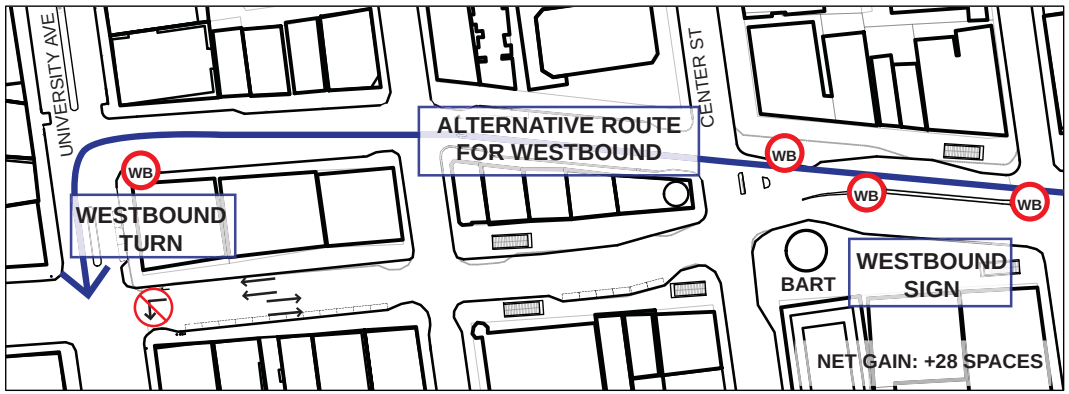


Figure d.18. East side of Shattuck Square. *By routing through traffic on the west side of Shattuck Square, 52 feet of asphalt devoted to the automobile (photo & 1st section above) could be transformed into a plaza or "slow street," which might also be the location for a new Downtown Transit Center (2nd section).*



Alternative with Left Turn at Shattuck & University -- **Preferred by subcommittee.**



Alternative with Westbound Turns from East Shattuck Square

Figure d.19. Shattuck Square - Near-Term. *Making traffic two-way on the west side of Shattuck Square will create opportunities on the east side to boost parking in the near term – and create a plaza or slow street in the long term (see Figure d.17).*

Design objectives for Shattuck Square include the following, subject to environmental and traffic analysis:

a. Reconfigure automobile traffic on Shattuck Square, so that the west side of Shattuck Square accommodates two-way through traffic, and the east side of Shattuck Square can become a slow street for local traffic, a slow street where only buses are allowed, or a plaza without traffic.

b. Evaluate the best configuration for routing traffic that is going north on Shattuck and then west on University. A left turn lane from the west side of Shattuck Square to University Avenue is preferred because it is easy to understand -- but a left-turn lane in this location would result in narrow lane widths, reduced crosswalk curb extensions, and elimination of parking spaces on west Shattuck Square. If lane widths are found to be insufficient, consider routing westbound traffic along the east side of Shattuck Square. To do this, northbound motorists who want to travel west on University would have to be guided by signs before they reach Shattuck Square.

c. If the east side of Shattuck Square is not needed for regular traffic, consider establishing a "transit plaza" limited to pedestrians, bicyclists, and buses. The transit plaza – in combination with other bus facilities along Shattuck between Addison & Allston – could establish a more functional "transit center" within Downtown. While Shattuck and the east side of Shattuck Square may be well suited to serve multiple bus lines, bus layovers should be avoided. The City should work with AC Transit to identify suitable layover locations in or near Downtown. This area should be designed as an inviting, pedestrian-friendly place with negative impacts from buses mitigated to the extent possible.

d. In the near-term, use the east side of Shattuck Avenue for additional parking to help offset on-street parking that may be lost because of near-term SOSIP improvements. Near-term improvements should also consider curb extensions on the southeast corner of the Shattuck-Center intersection and the northeast corner of the Shattuck-University intersection.

e. Consider creating a new entrance to BART on the east side of Shattuck to provide immediate and uninterrupted pedestrian access to the Center Street Plaza and the east side of Shattuck Square.

***Figure d.20. Shattuck Avenue North of Allston Improvements**: Center Street Greenway/ Plaza, Shattuck Square Improvements, University Avenue.*

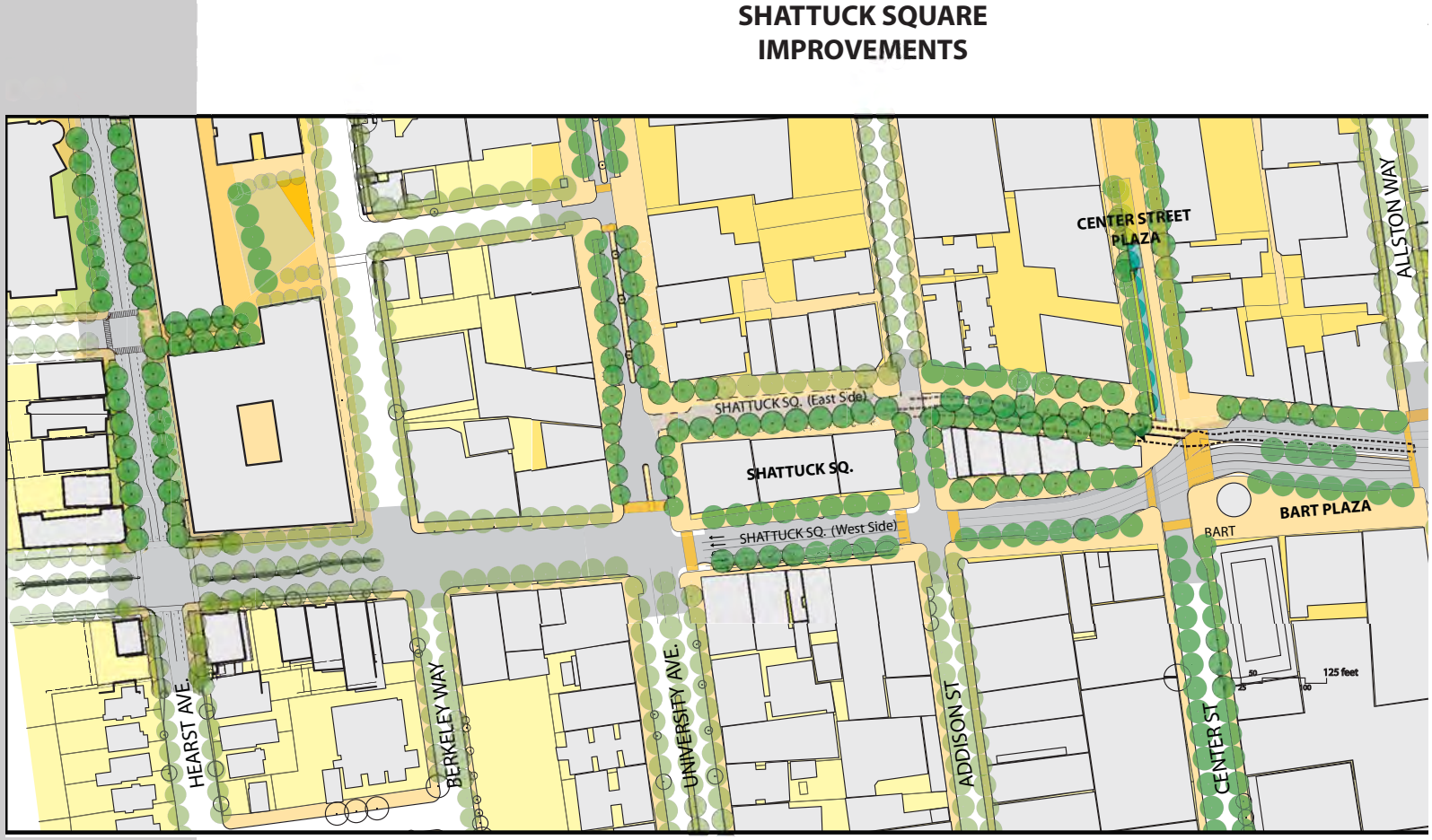
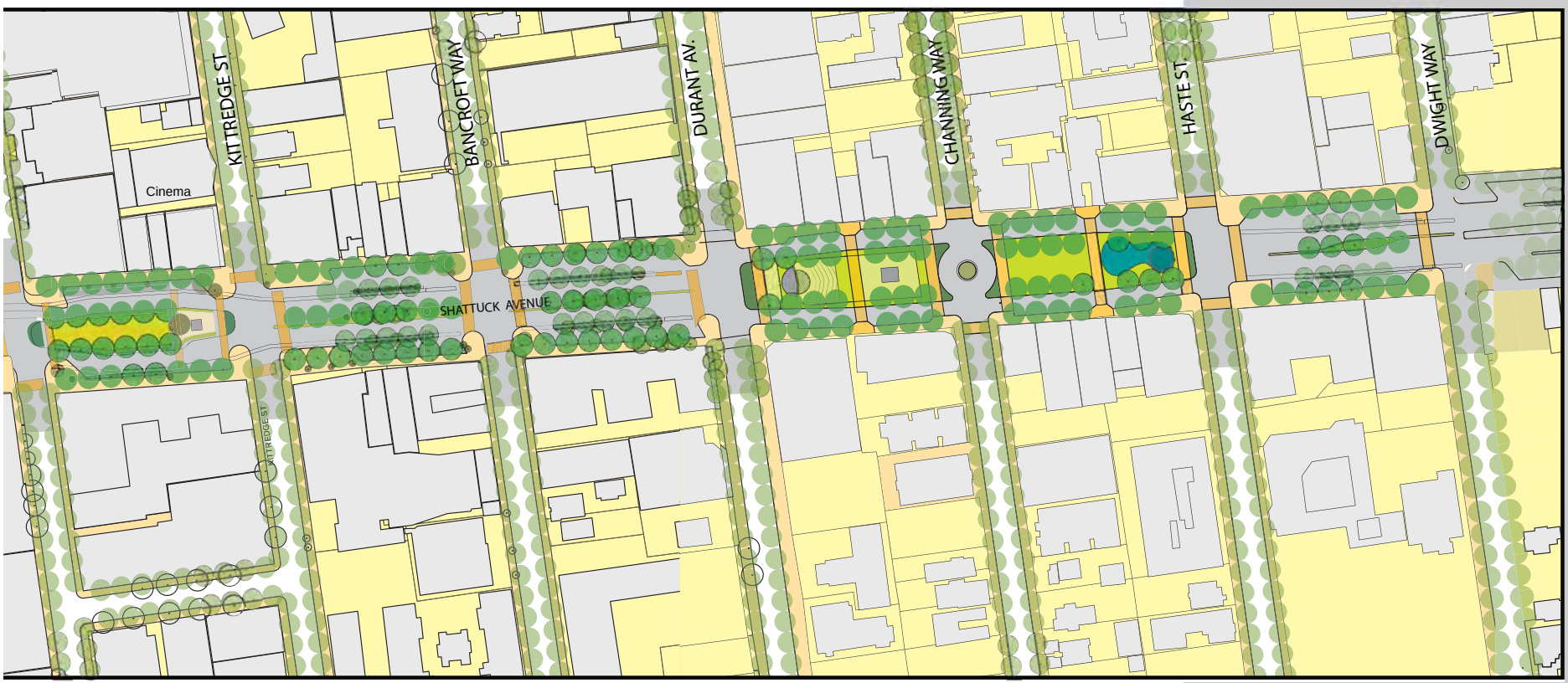


***Figure d.21. Shattuck Avenue South of Allston Improvements**: Allston-Kittredge Park Block, Lower Shattuck Park Blocks, with sidewalk widenings along other street segments. Bike lanes would run continuously south of Allston.*

ALLSTON-KITTREDGE PARK BLOCK

SHATTUCK BOULEVARD WITH BIKE LANES

DURANT-HASTE PARK BLOCK



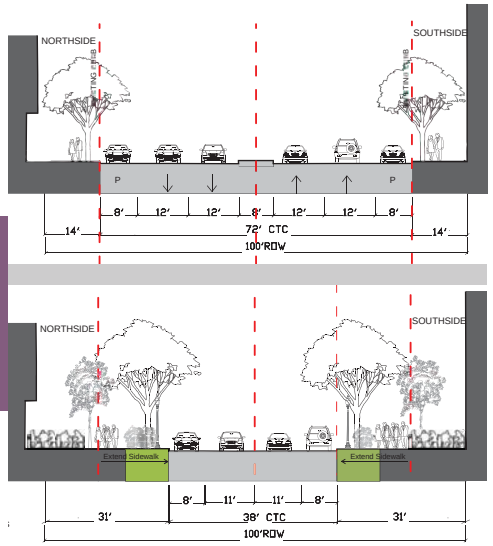


Figure d.22. University Avenue (Shattuck to Oxford. *At the end of University Avenue, traffic volumes drop and two traffic lanes might be eliminated to widen sidewalks, add amenities, and introduce green infrastructure. To maintain emergency vehicle access, the existing median above could be eliminated or could be made mountable by installing vertical deflection features (below).*

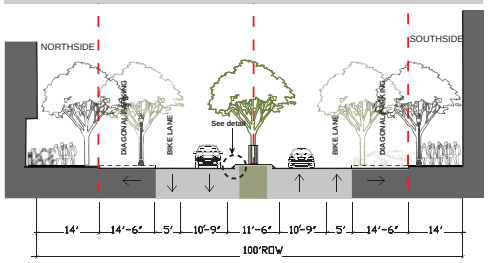


Figure d.23. University Avenue *showing median with mountable curbs.*

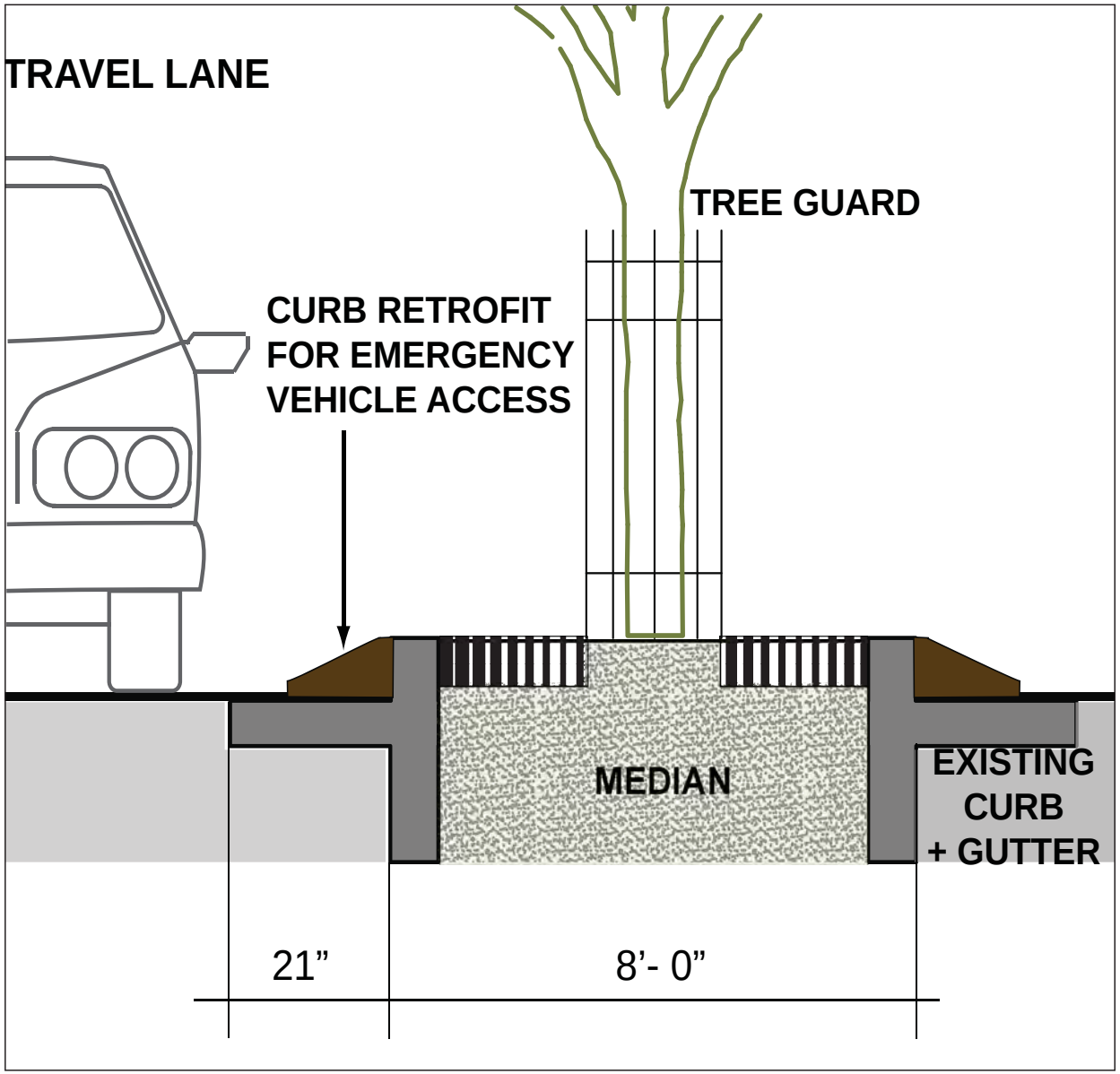
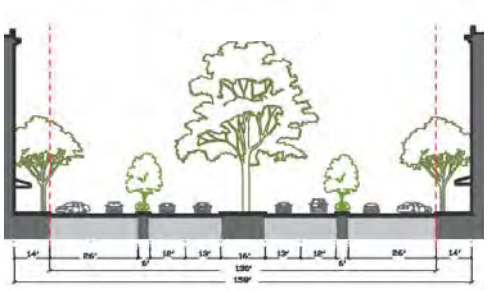


Figure d.24. University Avenue Median. *For the option where the center median is retained, it may be necessary to make curbs mountable for use by emergency vehicles.*

Figure d.25. University Avenue Improvements. *East of Shattuck, travel lanes on University Avenue can be eliminated to create wider sidewalks, bike lanes, green infrastructure, and pedestrian amenities. A cost-effective option would be limited curb extensions accompanied by bike lanes and diagonal parking (at top). By eliminating the existing center median (lower image), sidewalks can be made even wider and crosswalk distances shorter.*



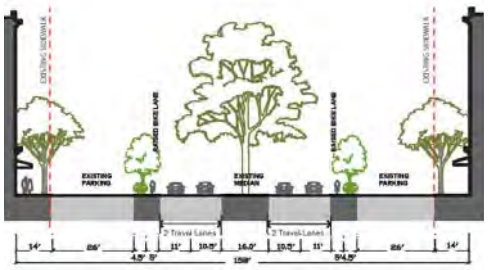


Figure d.26. Shattuck Avenue. *Bike lanes are proposed on Shattuck (photo & 1st section). Where parking access lanes are maintained, bike lanes would run just outside of traffic through lanes (2nd section).*

Reconfiguring Shattuck Square will require the realignment of bus routes. AC Transit and shuttle bus operators should be engaged as design development commences to determine how convenient, reliable, and reasonably fast transit service should be maintained.

University Avenue. The east end of University Avenue has the potential to become a recognizable "gateway" accentuating one's arrival to the Downtown and University. Sidewalk widening and other major improvements are possible. From Shattuck Square to Oxford Street, University Avenue has relatively low traffic volumes so two travel lanes can be eliminated. This project area is also notable in that it is lined by major development and historic rehabilitation opportunities that would benefit from and add pedestrian activity to streetscape enhancements.

Design objectives include:

a. Widen sidewalks, increase trees and landscaping, and add green infrastructure (like bio-retention "rain gardens") by eliminating unnecessary traffic lanes.

b. Consider using diagonal parking to increase the supply of on-street parking.

c. Maintain 20-feet clear for emergency vehicles, such as by: eliminating the median, using an acceptable mountable curb along the median, or by widening only the north side and keeping two lanes of eastbound traffic.

d. Consider the creation of outdoor dining, retail and information kiosks.

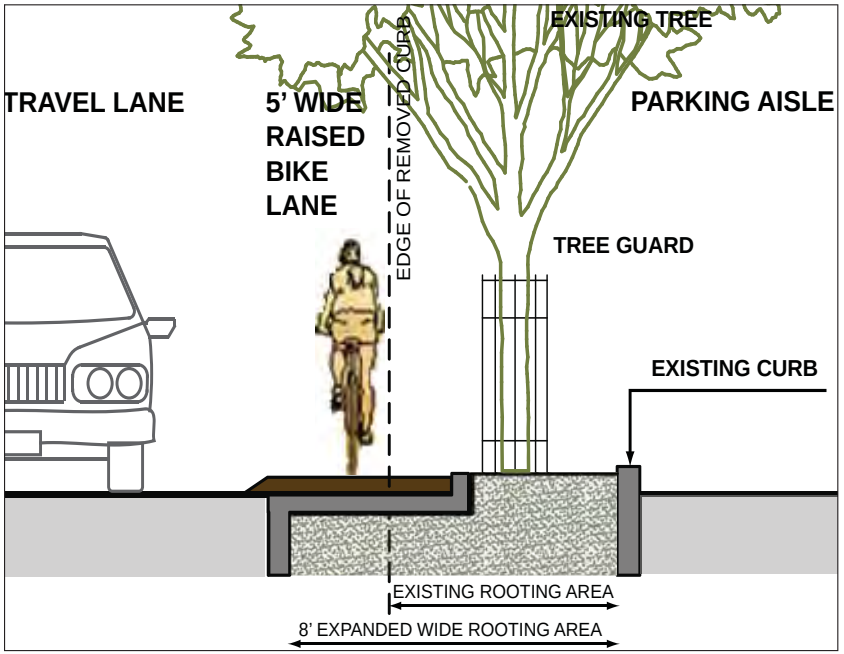


Figure d.27. Cross Section Of Potential Grade-Separated. *Bike Lane On Shattuck Boulevard.*

e. Coordinate with abutting property owners during design development, so that new improvements will complement anticipated uses.

f. Encourage the University to locate facilities for visitors to the University and Downtown along University Avenue.

g. Announce arrival to Downtown and the UC Campus with a highly visible focal point.

Policy 1.8, Shattuck Boulevard. Shattuck can be transformed into a world-class boulevard and a memorable aspect of Berkeley's identity. Shattuck is also Berkeley's commercial "main street" that grew up around its rail stations. Two rail lines (four tracks) used Shattuck which has a sizable 158-foot right-of-way. After rail service ended and when BART was constructed in Berkeley in the 1970s, Shattuck was redesigned to maximize parking. At that time, conventional wisdom deemed parking to be the principal disadvantage that downtowns had when competing with drive-to shopping centers. By the time of this writing, however, the proliferation of shopping centers and improved freeway access to them has made it impossible for Downtown to compete based on drive-to convenience alone. To succeed in the regional economy, Downtown – and especially Shattuck Avenue – must offer a distinct and attractive sense of place.

Two basic configurations are recommended for 158-foot portions of Shattuck. Shattuck is wide enough to contain a 60-foot wide linear park on some blocks. These "Park Blocks" are discussed in the next policy. The other configuration maintains the existing parking aisles but widens sidewalks, increases trees and landscaping, and adds bicycle lanes – design objectives for which follow. Bike lanes would

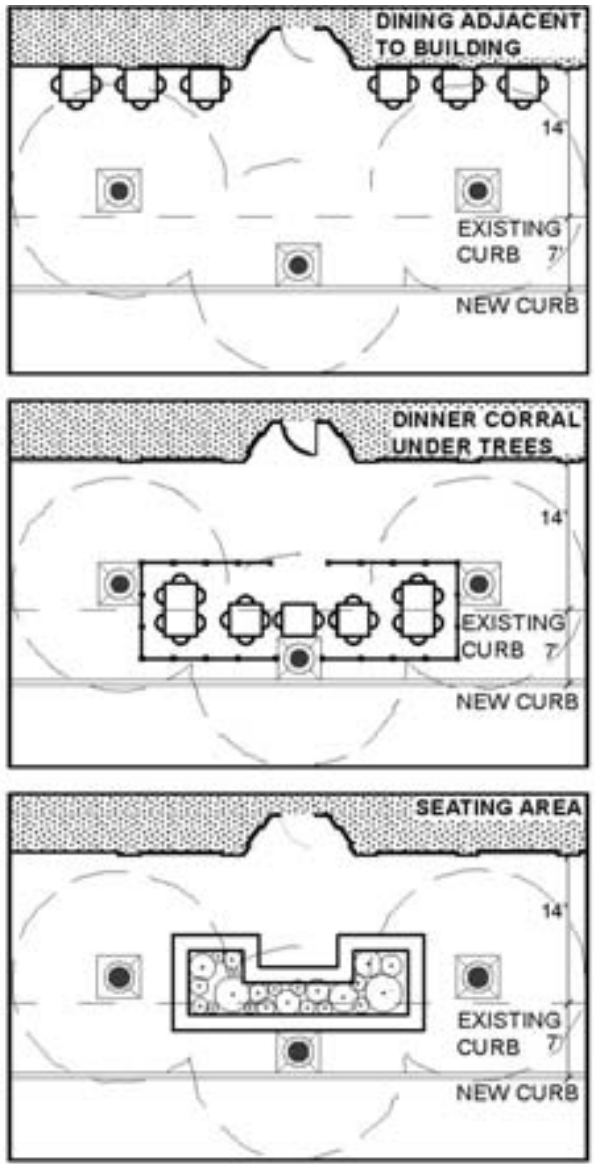
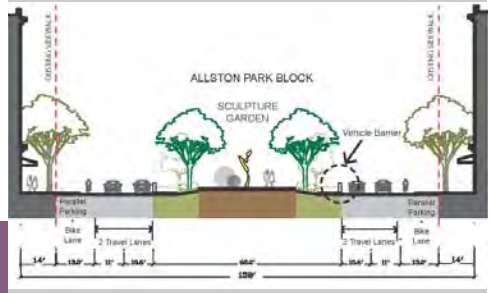


Figure d.28. Shattuck Avenue. *In the long term, parking can be reconfigured so that sidewalks can be widened for more amenities.*



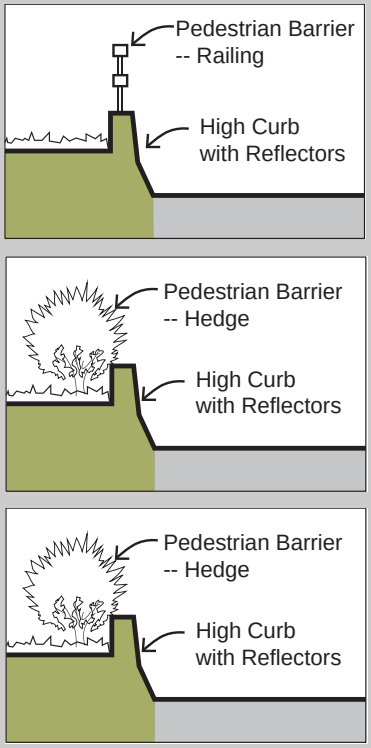


Figure d.29. Allston-Kittredge Park Block. *This "Park Block" would create an active attraction where BART and night-time cinema activity intersect. With a width of about 60 feet (see section above), the park can be programmed to be an attractive destination. Concerns that vehicles may compromise park safety can be addressed using design details such as those illustrated above.*

be needed if vehicle lanes are reduced and/or narrowed to maintain safety for all users.

a. Existing sidewalks have a width of 14 feet, which restricts activities such as outdoor dining. Widen sidewalks by about 7 feet and plant new trees, but in a way that minimizes crowding with existing trees. To widen the sidewalks, replace diagonal parking with parallel parking. Maintain side aisles for parking and the street trees that separate these aisles from through traffic while providing sufficient visibility for drivers.

b. Consider permeable paving, rain gardens, and green infrastructure features to capture and treat urban run-off as part of Shattuck improvements.

c. Add bicycle lanes by narrowing traffic lanes, while providing sufficient room for buses and trucks. Travel lanes on Shattuck should generally be 11 feet in width but – pending further analysis of conditions and operations – may be reduced. For example, it appears that – with the addition of bicycle lanes -- street trees in the landscaped median between Shattuck's parking aisles and travel lanes can only be saved if lane widths are reduced.

d. Address places where bicyclists, buses and other vehicles may conflict, such as through the use of "bike boxes" at intersections or other means.

e. Landscaped medians that are next to parking lanes would be narrowed where bicycle lanes are placed between Shat-

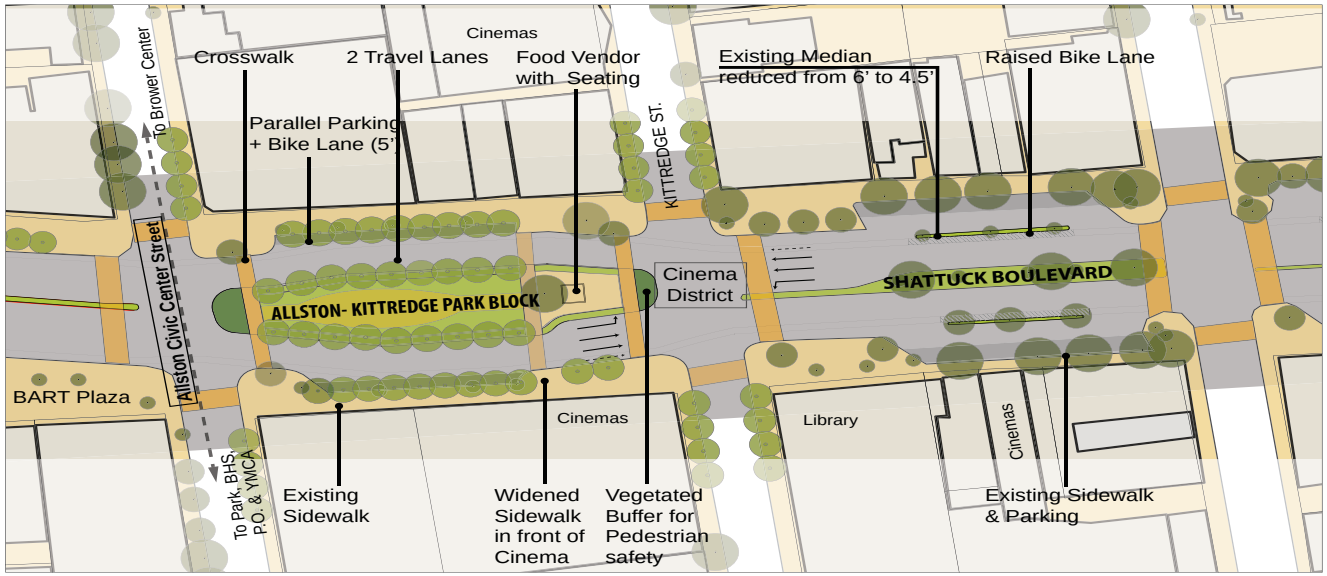


Figure d.30. Allston-Kittredge Park & Shattuck Boulevard Improvements. *This Park Block lies at the center of Downtown and will complement abutting uses including cinemas, BART, shops, civic uses on Allston, and Berkeley's public library. Shattuck can also be designed to widen sidewalks and add bike lanes.*

tuck travel lanes and the medians. A railing may have to accompany trees for the safety of bicyclists. Consider a grade-separated bicycle lane (a few inches in height) next to the tree medians, where motor vehicles will not merge through the bicycle lanes. Use structural soils below the bike lane where it abuts trees to promote tree health and avoid upheaval of pavement.

Policy 1.9, Shattuck Park Blocks (Figures d.29-d.32). Downtown and its surrounding residential neighborhoods are underserved by parks, compared with other places in Berkeley. The Shattuck right-of-way is wide enough to accommodate linear parks over 60 feet in width and 270 feet in length. This would be accomplished by reducing traffic lane widths and converting diagonal parking bays to paral-

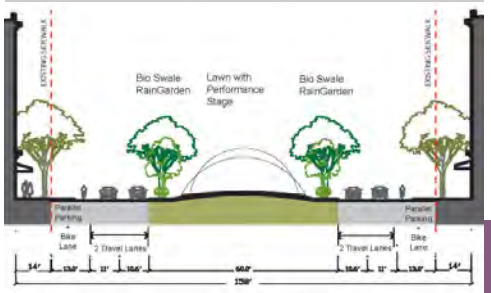
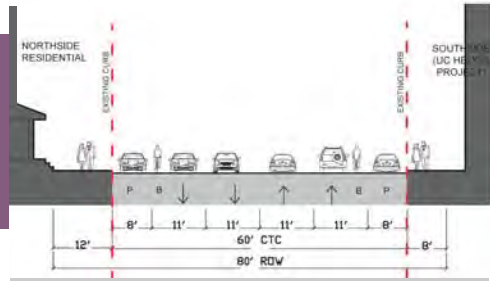


Figure d.32. Lower Shattuck Park Blocks (Durant to Haste). *This 60-foot-wide linear park can extend two blocks and can be programmed in a variety of ways.*

Figure d.31. Lower Shattuck Park Blocks. *This park will be designed and programmed to serve the needs of residents Downtown in surrounding residential neighborhoods.*



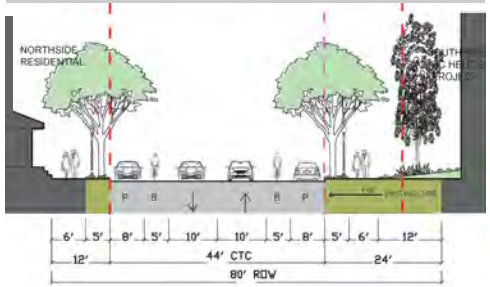


Figure d.33. Hearst Avenue / Ohlone Greenway (Shattuck to Oxford). *Analysis suggests that traffic lanes can be eliminated, so that this dimension can be reallocated to bicycle lanes and a landscaped greenway.*

lel parking. The Park Blocks would need to be well programmed so they are used appropriately and to their maximum potential. They would also have to be designed to prevent jaywalking and assure the safety of the people using them.

Allston-Kittredge Park Block. Strong retail uses and evening cinema activity, make the Allston-Kittredge segment of Shattuck Avenue one of the most active areas Downtown. While the presence of activity and people are key ingredients for a successful public space, narrow sidewalks only allow pedestrians to travel through – rather than occupy -- this area. A new park block would capitalize on synergies with surrounding commercial and residential uses -- and could be programmed to bring even more activity to this area. It would also help make the heart of Downtown more recognizable.

Design objectives for the Allston-Kittredge portion of Shattuck include:

a. Develop a “Park Block” in the center of Shattuck between Allston and Kittredge. Design and program this park to take full advantage of its proximity to cinemas, BART and other uses in the heart of Downtown.

b. The design and uses in the southern end of the park should take advantage of synergies with the nearby cinemas, such as by having a food vendor with outdoor seating.

Figure d.34. Hearst Avenue / Ohlone Greenway (Shattuck to Oxford).

c. The design and uses in the northern end should make use of high levels of foot traffic near BART. While a range of programming options exist, a sculpture garden has been suggested.

d. This Park Block, if distinctive, could also promote the identity of a "cinema district" at Kittredge. At its north end, distinctive park design might communicate that Allston has a unique civic focus with multiple community uses along it.

e. Design the perimeter of the Park Block to prevent jaywalking and to deflect cars that might jump the curb (see Figure d.30).

f. Include bicycle lanes and accommodate buses and other vehicles, but avoid excessive dimensions so the Park Block can be as wide as possible.

g. Work with BART to restore southern entry gates to further encourage pedestrian activity near Allston. This is made more feasible since the relocation the mezzanine level Bike Station from the southern entry gate area.

Lower Park Blocks. The Southside neighborhood and this part of Downtown has relatively little public open space, which could be addressed by Park Blocks. While Park Blocks could occur along any part of Shattuck's 158-foot right of way, development opportunity sites line the southern edge of Shattuck from Durant to Haste. These street segments might be transformed dramatically by the simultaneous development of a Park Block with abutting private development. Private development might also serve as a financial vehicle for the creation of this parkland.

Design objectives include:

a. Create "Park Blocks" in the lower parts of Shattuck within Downtown. Give special consideration to Park Blocks between Durant and Haste.

b. Program this park space to best serve the surrounding neighborhood and appeal to a range of ages. Engage the residential and business community when programming and designing the Park Blocks. Promising uses that have been illustrated include: outdoor performance, public restrooms, small lawn areas, plaza areas accompanied by seating and food vendors.

c. Incorporate green infrastructure. Explore the possibility of a larger rainwater retention area that might hold only a few inches of water but could demonstrate watershed management principles.

d. Retain curbside parking near established shops.

e. Design the perimeter of the Park Block to prevent jaywalking and to deflect cars that might otherwise jump the curb (see Figure d.30).

f. Include bicycle lanes and accommodate buses and other vehicles, but avoid excessive dimensions so the Park Blocks can be as wide as possible.

Policy 1.10, Hearst Avenue / Ohlone Greenway (Figures d.34 & d.35). The Ohlone Greenway is a continuous open space that stretches from downtown Richmond to the intersection of Hearst and Martin Luther King Jr. Way (MLK). The greenway contains a Class 1

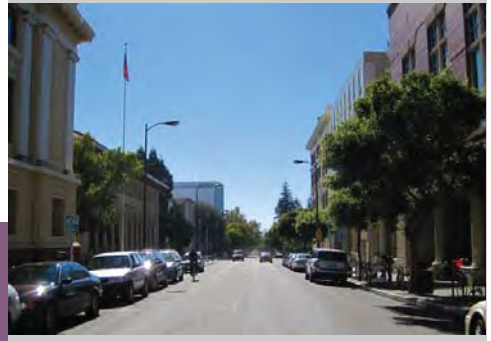


Figure d.35. Allston Way. *Several civic institutions face Allston Way, which also serves as an important east-west connection through Downtown. Traffic calming measures can make Allston better suited to high-levels of pedestrian and bicycle activity.*

Figure d.36. Harold Way. *Harold's tree canopy and intimate scale present the potential to make a special place.*

bike trail, grassy areas, and numerous amenities. Because Hearst Avenue need only have two travel lanes (except at some intersections), there is an opportunity to extend landscaping and bicycle facilities from where they end at Martin Luther King Jr. Way to the UC campus – a major regional destination. Landscaping and other enhancements along Hearst will also establish a recognizable and attractive northern boundary to Downtown. In addition, Hearst landscaping and other treatments can express a Downtown "gateway" along Shattuck.

Design objectives include the following.

a. Provide continuous bicycle lanes along the portion of Hearst within the Downtown. Address how bicyclists, vehicles and pedestrians can merge safely at intersections. Consider how bicycle facilities might continue east on Hearst when designing the intersection at Oxford.

b. Consider expanding landscaping on the south side of Hearst where Hearst can be reduced from 4 to 2 travel lanes. A landscape strip with street trees could separate a new sidewalk from the curb. Between the sidewalk and property line, landscaping should include trees and large shrubs to mitigate the scale of abutting UC development. Consider ways elevate this landscaping to be visually prominent through the use of planters and/or berms.

c. Along the north side, maintain a sidewalk width of at least 5 feet and leave the existing curb in place. Adjacent to the curb, remove excess concrete to plant street trees in tree basins or in continuous landscaping strips.

d. Install curb extensions at intersections for pedestrian safety and amenity. Use a curb extension and place amenities at the entry point to the UC development site (at the end of Walnut).

e. Incorporate rain gardens and other green infrastructure (see Watershed Management & Green Infrastructure).

f. Collaborate with the University in the design of this project so that functional and aesthetic relationships between this project and abutting UC development can be addressed. Consider using City right-of-way to retain run-off from UC development, possibly through the use of cisterns so rainwater can be used for irrigation.

g. Just west of Shattuck, consider closing Henry Street at Hearst to provide a more continuous and protected bike lane and pedestrian path, while maintaining emergency vehicle access.

Policy 1.11, Bicycle Facilities. Bicycle circulation in the Downtown should be improved by expanding bicycle facilities consistent with the Bicycle Master Plan and policies contained in the SOSIP Bicycle Network & Facilities chapter.

Policy 1.12, Transit Performance. Work with AC Transit and shuttle operators to minimize bus travel times, enhance bus reliability, and promote bus ridership.

a. Use traffic signal technology to give buses priority at intersections. Recognize Shattuck Avenue as a "Primary Route" for transit, where buses should have priority over private vehicles.

b. Support bus operations and reliability, by using features such as queue jump lanes, left turn phasing, bus curb extensions, pre-pay fare vending machines, concrete bus pads, and raised platforms. Refer to AC Transit's handbook, Designing With Transit, when developing the design of SOSIP projects.

c. Evaluate the potential impacts of proposed street and street network changes on transit service. As designs of SOSIP projects are developed, address how bus routes, bus layover, and other transit functions will be accommodated. Street improvements should be designed to avoid an appreciable decline in bus travel times and reliability. Evaluate the performance of buses and other modes after street improvements to find ways to further support bus service.

d. Evaluate and minimize potential negative impacts of proposed bicycle lanes on Shattuck Avenue. Use signal technology, design, and signage to minimize conflicts between buses and bicyclists.

Policy 1.13, Attractive Transit. Street improvements should promote bus riding as an attractive travel option.

a. Promote "complete streets" that enhance pedestrian and bicycle routes to transit, through the use of pedestrian-scaled lighting, wider sidewalks, bicycle facilities, and pedestrian amenities.

b. Allow bus platforms and relocate bus stops to reduce boarding times and improve reliability, except where they conflict with pedestrians, bicyclists, safety, and economic development priorities.

c. Work with AC Transit to provide attractive bus stops and shelters that are integrated and harmonize with pedestrian and bicycle facilities and adjacent land uses.

Policy 1.14, Transit Center. Consider locations for creating a Transit Center for bus transfers and layovers in Downtown, and factor the needs of potential Transit Centers into the design of SOSIP projects. One potential site for a transit center is the east side of Shattuck Square.

Policy 1.15, Minor Opportunities. There are several smaller projects that merit consideration but have not been developed as part of the SOSIP. These potential projects include:

a. Allston Way as a Special Civic Street. Celebrate Allston Way as an important civic connection between MLK Civic Center Park and the UC Campus. Use special light standards, special paving treatments, street furnishings, and banners to make Allston more recognizable and to support pedestrian activity. Street improvements should highlight civic destinations along Allston Way including Old City Hall, Berkeley High School, the Post Office, the YMCA, the Berkeley Public Library (via Harold Way), the Brower Center, and the UC Campus.

a. Enhance Allston Way as a bicycle route through the use of traffic calming and/or shared street features, and by making biking between Allston and the UC Campus easier and safer.

b. Harold Way (between Allston & Kittredge). Harold Way is a quiet one-block tree-lined street, which is a good candidate for be-

Figure d.37. Programming Open Space. *Design and events should promote active and appropriate use of open spaces, such by having outdoor dining vendors in San Jose's Santana Row (above).*

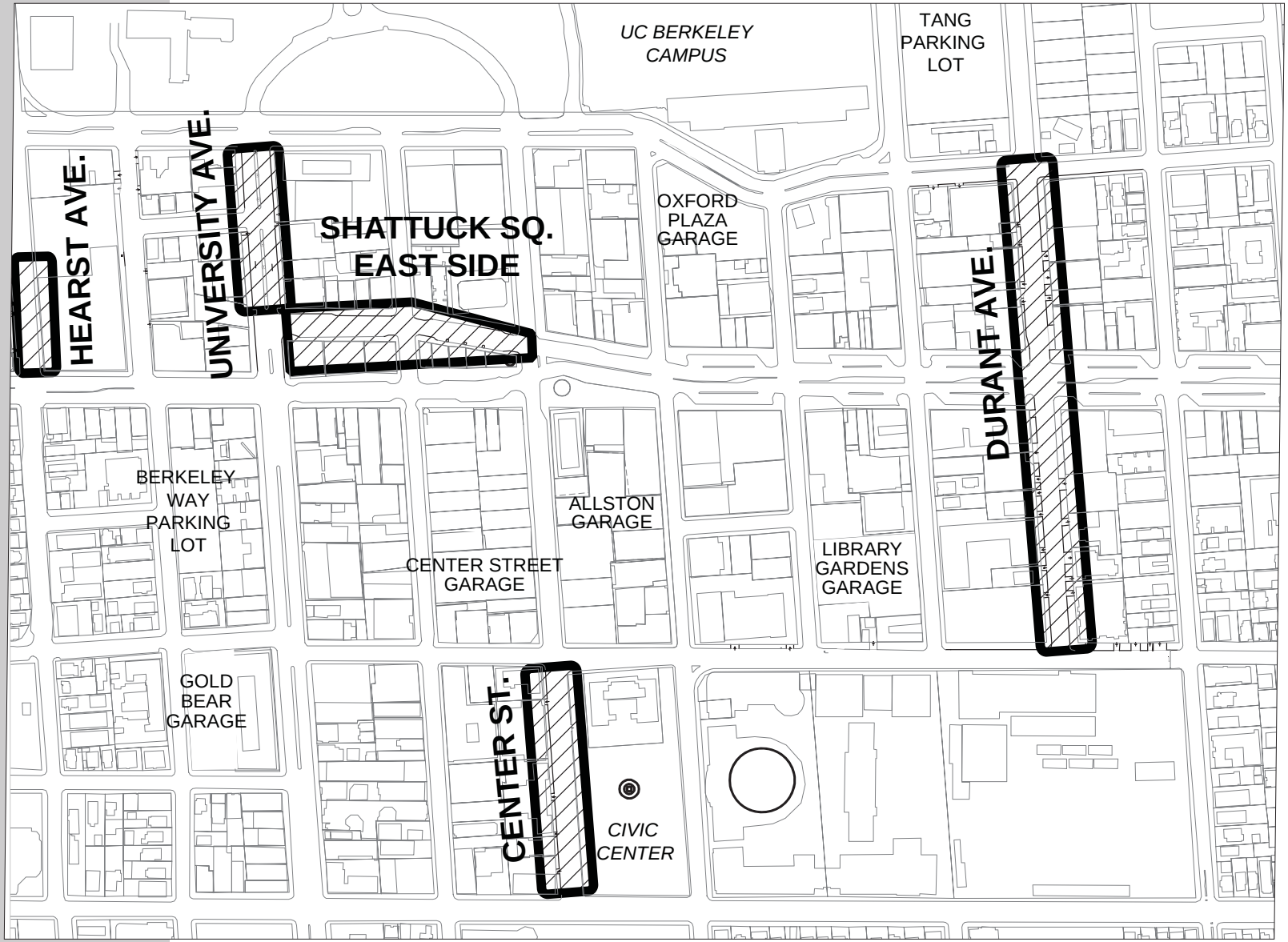


Figure d.38. Opportunities to Increase On-Street Parking. *Over the long-term, other parking and transportation programs would take effect and make additional SOSIP improvements possible.*

coming a slow street or plaza-like shared street (see Policy 2.3, Shared Streets). Design Harold Way to support abutting uses including the Central Library. Also consider that future Shattuck Hotel conference facilities might have a main entrance on Harold Way. Establish an unobstructed view of Library Garden's gate as seen from Harold Way, such as by removing on-street parking on Kittredge Way. Consider façade improvements to the Allston Way Garage to create a more attractive vista at the north end of Harold Way.

a. Terminal Place (an alley off of Addison & just east of Shattuck Square). Consider improving Terminal Place to become an active and attractive public open space. Consider creating a midblock walkway between Terminal Place and University Avenue through the cooperation of effected land owners.

Policy 1.16, Oxford-Fulton Corridor. The Oxford-Fulton corridor has the potential of becoming a signature streetscape that marks the threshold between Downtown and the UC campus. It also plays a vital functional role in serving motorists who are passing through Downtown, bicyclists who use bicycle lanes, and accommodates high volumes of pedestrian crossings. In addition, major UC projects and open spaces are adjacent to the Oxford-Fulton corridor and can be complemented by public improvements.

a. The City and UC should work in partnership to design and implement improvements along the Oxford-Fulton corridor. Consideration should be given not only to the street right-of-way but also to UC open spaces such as the Crescent and a potential future open space at the end of Kittredge. Plans should address: pedestrian & bicycle safety and connectivity; ways to support and complement abutting uses; promoting an attractive and recognizable identity; and promoting healthy watersheds.

Policy 1.17, Programming Public Spaces. "Programming" is the decision making process that identifies required and desirable functions and activities, along with the features that support them. Program considerations may lead to refinements to the placement, size and design of open spaces. Careful programming of public open space is imperative in urban settings to maximize benefits to the community and to avoid unwanted behavior.

a. Design development for each project should begin with a review of program assumptions contained in SOSIP policies and illustrations.

b. Programming should identify possible synergies with surrounding uses, and should consider benefits and risks associated with each program element.

c. Find ways to increase recreational space in Downtown, especially for the benefit of residents. Specifically, consider programming recreational activities into the Lower Park Blocks, and consider the creation of recreational space on the roof of the Center Street Garage when it is rebuilt.

d. Expensive features should only be carried forward during design development when extraordinary public benefits can be expected.

e. Features that might encourage unwanted behavior should be avoided unless high

Figure d.39. Parklets. *Many cities use on-street parking spaces as temporary locations for outdoor dining (e.g., New York City, top), seating areas (e.g., San Francisco, middle), and events (e.g., Berkeley, bottom).*

levels of pedestrian activity can be expected or the space can be regularly monitored by public entities or private concessionaires. Landscaped areas can discourage unwanted behavior if access is limited – not just by barriers but also by selecting inhospitable plant species or through other design devices.

f. Food operations should only be conducted within buildings and in permanent pavilions. Consider food carts only if standards and design guidelines are established to assure that they will be attractive, hygienic, and in good repair. Food operations should only be allowed where refuse storage and pickup is adequately addressed, and with a written agreement to keep the vicinity of concession clean.

g. Give existing Berkeley food establishments the first right-of-refusal to lease food pavilions and operate carts should they be allowed.

h. Downtown would benefit by adding some types of retail and services. Consider allowing vendors in appropriate locations to offer the following: magazines, flowers, art, handcrafted jewelry & toys, shoe shining services, transit passes, and ticket sales. Retail and services offered in public open spaces be at least a few blocks from similar storefront businesses.

Policy 1.18, Net-Zero Parking Strategy. If not adequately addressed, a negative impact from SOSIP improvements could be a reduction in the number of on-street parking spaces. Nearly all on-street spaces are occupied during periods of peak demand in the heart of Downtown (roughly from University to Bancroft).

a. On-street parking that is lost because of street and open space improvements should be replaced by an equal number of new nearby on-street parking spaces. There should be no net loss of parking until parking & transportation demand management programs are implemented and attain a target of one vacant on-street parking space per block face (about one vacant space for every ten spaces) during peak demand under typical conditions. Accessible parking standards should be met.

b. To make on-street parking more available, the price of on-street parking would be raised in locations of high demand to motivate some motorists to park in garages or in on-street locations that

c. To implement the net-zero parking strategy, consider increasing on-street parking on the following streets – especially in the near-term: the east side of Shattuck Square, Berkeley Way, Hearst Avenue, Durant, and where Center is adjacent to Civic Center Park (where parking that is reserved might be moved to an off-street location). Because of its central location, Shattuck Square deserves special consideration as part of a near-term on-street parking strategy.

Policy 1.19, Transit & Parking. Coordinate transit and parking policies to increase transit ridership while making on-street parking more available.

a. Implement Parking & Transportation Demand Management (PTDM) programs to encourage transit use, especially for commute trips to work or school. Specifically, use PTDM programs to make short-term

parking more available for people who are shopping, or going to a show or museum. Possible programs include promoting transit pass subsidies to reduce demand for commuter parking, and pricing strategies that shift demand from on-street spaces to underutilized garages.

PEDESTRIAN ENVIRONMENTS & SHARED STREETS

PEDESTRIAN ENVIRONMENTS & SHARED STREETS

PRINCIPAL CONSIDERATIONS

Pedestrian Priority. This chapter describes features that delineate where pedestrians can walk safely and enjoy shared experiences. If appropriately designed, these features make the pedestrian experience more attractive. There are numerous co-benefits associated with enhanced pedestrian environments. Attractive environments are foundational to Downtown's retail success and as a residential neighborhood. The walking experience is also an integral part of transit use, as every trip begins "on foot."

Because Downtown's primary function is as a place to engage in social, cultural and commercial activity, special emphasis needs to be given to the safety, comfort, and convenience of pedestrians. Automobiles need to be accommodated, but negative impacts from cars on pedestrians should be mitigated.

Enhancing the Pedestrian Realm. In Downtown, the factors that generally define what is -- and what is not -- part of the pedestrian realm are curbs and buildings. Buildings define the outer edge of most sidewalks. While private uses, pedestrian-friendly building design, and midblock pedestrian connections are extremely important, private building and site attributes are controlled by the City's Zoning Ordinance and the Downtown Design Guidelines.

Within City-controlled rights-of-way, the location and shape of curbs strongly influence pedestrian safety and comfort -- and how public space can be used. Spaces that are behind curbs are generally the most protected spaces for pedestrians, and are where pedestrian amenities and landscaping may be placed. While the SOSIP seeks to optimize pedestrian space, curbs must also be positioned to provide adequate dimension for the safe movement of motorized vehicles and bicycles.

Beyond the curb, pedestrian activity is extended into roadways lanes and intersections through the use of crosswalks, medians, and special features. Jaywalking aside, these are the places where pedestrians and cars share the same space and injury to pedestrians is of greatest concern. The design and placement of crosswalks, medians, and special features must address pedestrian safety but also pedestrian convenience and accessibility. Pedestrians often react to overly circuitous routes with frustration and jaywalking.

Context-Sensitive Design. Older urban settings often have narrow streets and high pedestrian volumes, conditions that may not be fully recognized by modern street design manuals that were developed with suburban growth in mind. By allowing narrower lanes and tighter intersections, Berkeley has joined other cities like San Francisco and Portland, Oregon, where similar pedestrian-oriented standards have been adopted, and balanced mixed-mode approaches are becoming accepted more broadly as evidenced by ITE's Context Sensitive Solutions in Designing Major Urban Thoroughfares.

Facing Page: Pedestrian Realm. *The experience of walking and sitting will play a critical role in Downtown's success as a destination – and as a place to live and work. Staff photo.*

Pedestrian Safety & Lane Widths. Narrower travel lanes can make streets safer for pedestrians by slowing traffic, which significantly reduces the severity of injuries. In fact, the likelihood of fatal or serious pedestrian injuries becomes very low when vehicle travel speeds fall below 20 miles per hour (Source: Anderson, McLean, Farmer, Lee and Brooks, Accident Analysis & Prevention Study, 1997). At the same time, travel lanes should not be made so narrow that wide vehicles such as buses and trucks might conflict with cars, and where motorists cannot safely pass bicyclists, particularly when motorized vehicles are traveling significantly faster.

Because the widths of rights-of-way are fixed, sidewalks and landscaping widths are what remain after vehicle and bicycle lanes are accounted for. Traffic modeling for the Downtown Area Plan's EIR has demonstrated that travel lanes can be eliminated on several street segments without significantly increasing congestion. On-street parking can also be reconfigured to make more space available for pedestrians.

Pedestrian Crossings. At the corners of intersections, tighter curb radii bring curbs closer to the moving vehicles. Tighter curb radii and pedestrian refuge areas slow vehicle travel, shorten pedestrian crossing distances and increase the ability for pedestrians and motorists to see each other. While tighter curb radii may make turns more difficult for the longest vehicles, wider curb radii come at the expense of the pedestrian and tighter curb radii are more appropriate to Downtown.

Curb Extensions. Curb extensions extend the sidewalk into the parking lane to reduce pedestrian crossing distances, slow traffic, and improve pedestrians' ability to see oncoming motorists and vice versa. Curb extensions are also called "bulb-outs" and "bump-outs" to describe their shape. In addition to enhancing pedestrian safety, curb extensions can contain street furnishings, green infrastructure measures, and other amenities. Curb extensions also make it easier to have two curb ramps at each corner.

Shared Streets. There are also "shared streets" or plazas where pedestrians, motorists and bicyclists share the same plaza hardscape. Shared streets are common in Europe

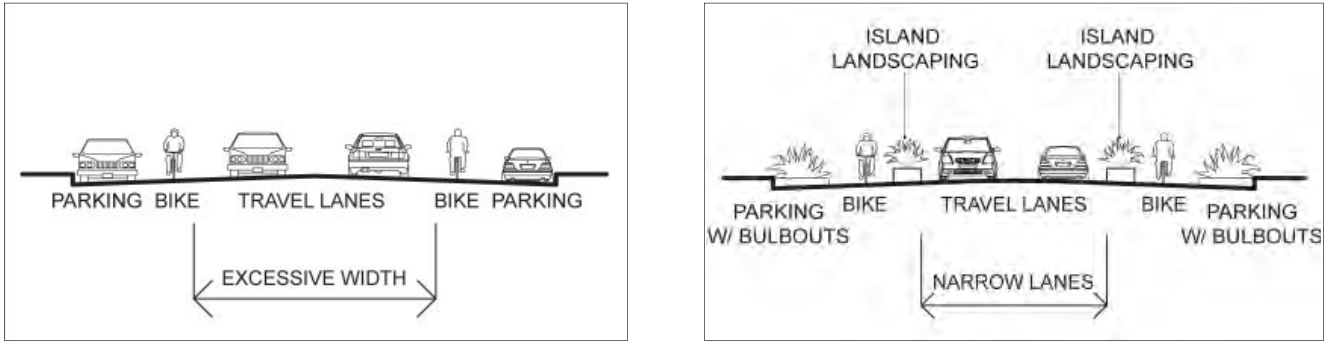


Figure e.1. Lane Widths & Traffic Calming. *Motorists tend to speed up when travel lanes are excessive or few landscaped islands are present.*

and are being seen increasingly in the United States. In these settings, the comfort and safety of the pedestrian is emphasized through the use of materials and design. Vehicles move very slowly and pedestrians clearly have the right of way. Shared streets are appropriate where pedestrian use of the space has priority over vehicles, and where citywide impacts on vehicle through-traffic have been addressed.

Landscaping. Landscaping and special features can also limit where pedestrians move. In addition, landscaping is an integral part of the pedestrian environment because of trees and landscaping create favorable micro-climates and make places more attractive.

Bus Service. Bus operations and the need for safe boarding and alighting at bus stops should be considered and addressed. AC Transit staff and "Designing with Transit" should be consulted during design development.

Relationship to Other Documents. Note that the following recommendations highlight and augment Berkeley's Pedestrian Master Plan, Bicycle Master Plan, and Municipal Code. Users of this document should refer to these other documents for additional background and recommendations. A few recommendations made by the SOSIP are inconsistent with these other documents because of Downtown's unique needs and setting. Unless and until adopted by Council as formal amendments to the Pedestrian and Bicycle Master Plans, SOSIP recommendations shall be considered advisory.

POLICIES AND ACTIONS

Policy 2.1, Pedestrian Realm. Enhance and increase protected areas for pedestrians, while promoting bicycling and accommodating motor vehicles.

a. Pedestrians and persons using wheelchairs shall have an uninterrupted path of travel. On commercial streets, maintain a 6-foot wide unobstructed path free from fixed features and moveable furniture.

b. Position transit shelters, newsracks, trash receptacles, and other obstructions to facilitate access and ease of pedestrian

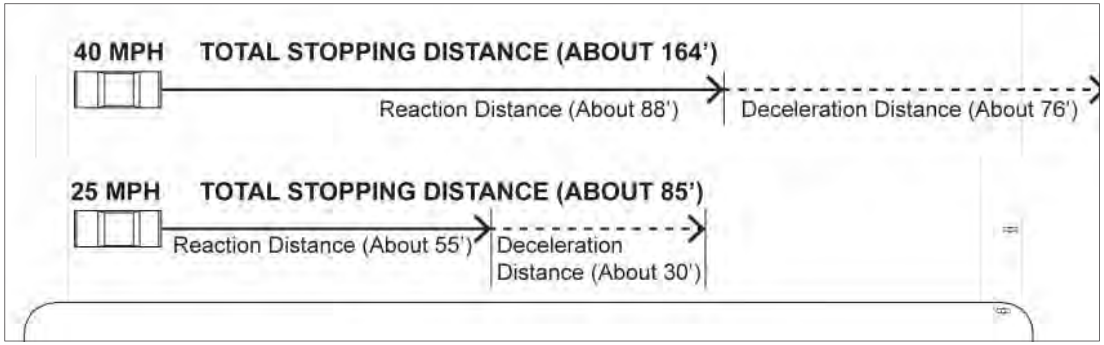
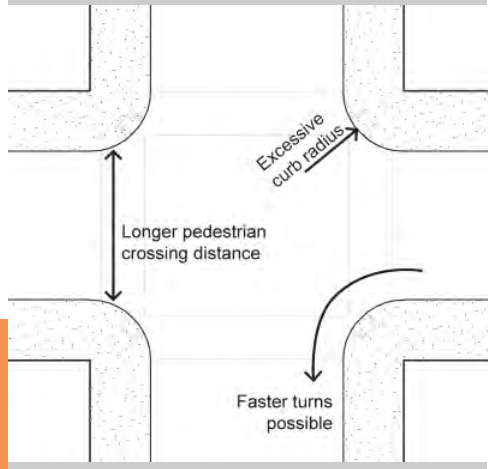
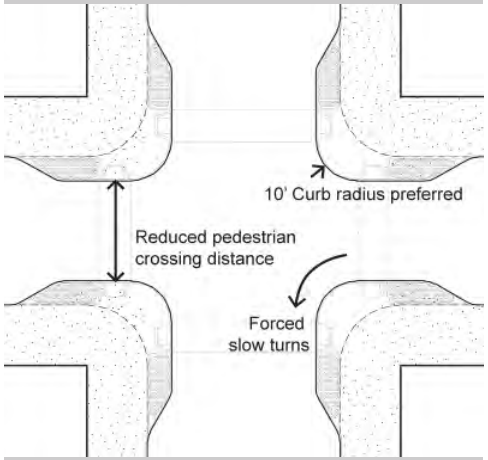


Figure e.2. Travel Speeds & Pedestrian Safety. *The rate and severity of pedestrian injuries goes up as the speed of traffic increases.*



Typical Intersection.



Corner Bulb Outs.

Figure e.3. Curb Radii & Bump-Outs. *At intersections, large sweeping curbs allow faster and less safe traffic speeds. Tighter curb radii help slow traffic. Tighter radii also reduce the crosswalk distances in which pedestrians are exposed to traffic, especially when combined with corner "bump-outs" or curb extensions.*

movement. Where space behind such features is unusable, it should be minimized except for maintenance needs.

c. Expand areas available for pedestrians (and bicyclists) by repurposing unnecessary and excessive motor-vehicle travel lanes (i.e. where unacceptable levels of congestion and unsafe conditions would not result). Lane eliminations proposed by the SOSIP were evaluated by the 2009 Downtown Area Plan EIR, and are the basis for the schematic design concepts presented under "Major Projects." However, travel lanes should only be eliminated after traffic modeling and environmental analysis have determined that pedestrian/bicycle safety, transit operations, and traffic considerations has been adequately addressed.

d. For pedestrian and bicycle improvements, minimum travel lane widths may be narrower Downtown than is generally allowed in Berkeley. Doing so will make it possible to widen sidewalks, increase planting and add urban amenities. Allow travel lanes as narrow as 10 feet on side streets and 10.5 feet on major streets (such as Shattuck, University, Oxford-Fulton, Martin Luther King Jr. Way), except where needed to accommodate buses -- in which 11 feet should generally be provided. Recommendations for bicycle lanes should also be considered (see Bicycle Network & Facilities). Parallel parking lanes may be between 7 to 8 feet in width, and should be 8 feet where the doors on parked vehicles are likely to conflict with bicycles; parking lanes must always be 8 feet alongside Class II bicycle lanes.

e. After anticipated parking and transit programs become effective, convert diagonal parking to parallel parking to widen sidewalks and increase landscaping in locations with high levels of pedestrian activity. In the near-term, on-street parking that is lost because of street and open space improvements should be replaced with additional on-street parking within a reasonable walking distance (as depicted in Major Projects).

f. Consider the use of parking lanes for other activities in areas of high pedestrian activity and when parking demand is addressed. Examples include weekend dining, occasional street fairs, and temporary art installations. Activities should be separated from travel lanes with substantial planters, railings, or other elements. Elements should also be designed to alert motorists and prevent pedestrians from stepping into travel lanes.

Policy 2.2, Pedestrian Crossings & Traffic Calming. Enhance safety where pedestrians cross traffic through the use of crosswalks, pedestrian refuges and traffic calming features.

a. Curb radii as tight as 10 feet should be allowed in the Downtown, and curb radii should generally not exceed 15 feet.[4] Where vehicle turning remains a concern, the "effective" turning radius (and not solely the curb radius) should be considered, such as: where parking lanes are clear near intersections, or where larger trucks can safely move into other lanes on an occasional basis. Address bus operation needs during design development. Where a larger curb radius must be used, consider using reflectors or special paving to delineate a 10-foot radius to discourage high-speed turns by vehicles.

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4 *Berkeley Municipal Code Section 21.40.150 calls for a minimum curb radius of 15 feet.*

b. Consider adding curb extensions or "bulb outs" at intersections, especially intersections with higher rates of collisions involving pedestrians, but only in ways that allow passengers to safely board and alight at bus stops.

c. Also consider midblock curb extensions where pedestrians frequently jay walk, where midblock passages meet streets, and in locations that would improve access to Shattuck "park blocks." Note however that midblock crosswalks should generally be avoided except where higher levels of use can be expected and safety can be maintained. Ramps should accompany midblock crosswalks and consideration should be given to traffic signals, pedestrian-activated flashing beacons or similarly effective alternatives. Maintain bus stops with sufficient dimension for passengers to safely board and alight.

d. Curb extensions that are used for pedestrian crossings or seating should be accompanied by metal safety bollards or other safety features. Curb extensions should generally include landscaping, and might also contain street trees, furnishings, and features to capture urban runoff (see Watershed Management & Ecological Design).

e. Curb extensions should be designed to provide adequate drainage and adequate access for transit vehicles, emergency vehicles and fire hydrants. As indicated in the City's Pedestrian Master Plan and accompanying environmental documents, the City shall not construct bulb outs that extend into travel lanes, including bicycle lanes.

f. Temporary curb extensions may be considered where impacts and benefits are unclear. Temporary curb extensions can be created through the use of striping, plastic bollards and raised reflectors, while maintaining accessibility for people who are disabled.

g. Consider the use of "neck downs" or "chokers" to clearly communicate pedestrian crossings to motorists, and to reduce the perceived width of the street and thereby slow traffic. Neck downs are created when a curb extension is paired with another curb extension across the street.

h. Medians should generally be provided on streets that have four or more travel lanes, to give pedestrians a place of refuge and offer opportunities for landscaping and urban run-off features. Crosswalks should "pass through" medians (with a raised curb on both sides), to provide a pedestrian refuge.

i. Medians should generally be avoided on streets that have fewer than four travel lanes, except when used to slow traffic at crosswalks, since motorists tend to go faster when they are separated from opposing traffic lanes. To maintain clear passage for emergency vehicles, and medians can also necessitate wider travel lanes that increase vehicle speeds and crossing distances.

j. Corner islands that provide right-turning "slip lanes" should be avoided with pedestrian crosswalks because of motorist navigate these sweeping turns at higher speeds. Consider elimination of the slip lane at Bancroft and Fulton. Where existing slip lanes will remain, features should be added to reduce vehicle speeds or

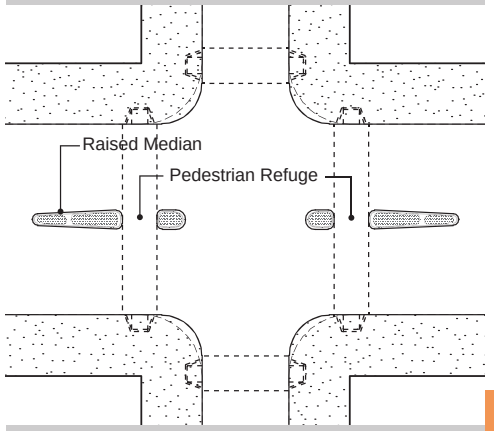


Figure e.4. Pedestrian Refuge Areas. *Along crosswalks, a raised curb or median protects pedestrians – especially those with limited mobility – who are only able to cross part of the way before encountering traffic because the signal has changed.*

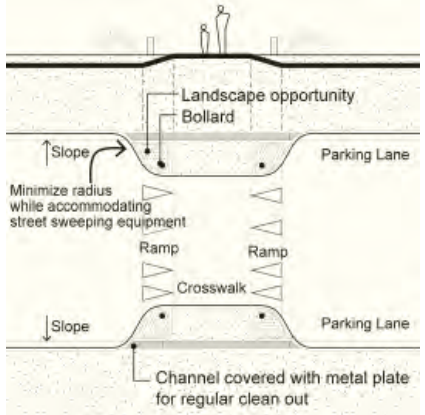
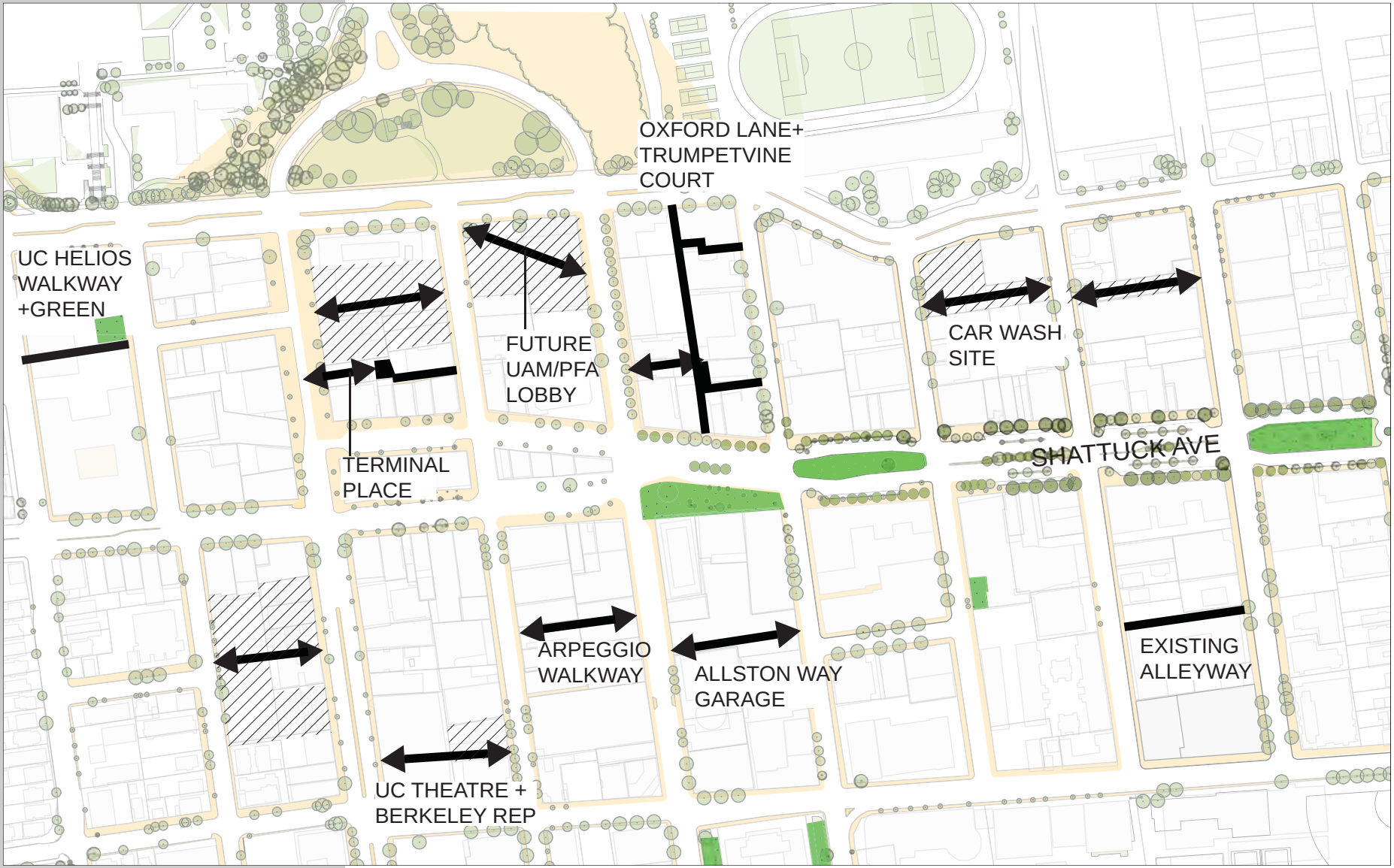


Figure e.5. Midblock Crosswalks. *Midblock crosswalks should be considered where block lengths are long and the rate of jaywalking is high. These crosswalks can be accompanied by curb extensions to reduce pedestrian crossing distances. In addition, ramping up to the crosswalk can slow vehicles and make pedestrians in the crosswalk more visible.*

Figure e.6. Existing & Potenial Connections on Private Property. *Midblock connections complement public streets & open space, by shortening walking distances and providing courtyards. The types of connections illustrated could be encouraged using development standards and design guidelines.*



bring vehicles to a full stop before proceeding.

k. Perpendicular ramps allow pedestrians and people in wheelchairs to access the sidewalk perpendicular to stopped traffic, and to enter into the crosswalk directly in their line of travel. Perpendicular curb ramps are preferred over the use of a less-protected single ramp.

l. Consider additional crosswalks in Downtown locations where significant numbers of pedestrians cross. Crosswalk design should follow the City's Pedestrian Plan Design Guidelines, wherein high levels of pedestrian activity should use high visibility treatments, such as "ladder style" crosswalk markings.

m. Crosswalks with high levels of pedestrian activity should have "ladder style" crosswalk markings.

n. Flashing beacons or similarly effective devices should accompany midblock crosswalks and unsignalized intersections with higher levels of pedestrian and/or bicycle traffic.

o. Pedestrian activated ("push-button") light signals should be used at intersections where priority should be given to pedestrians on a more occasional "on-demand" basis. All push-button activated flashing beacon locations should have "Cross with Caution" signs in view of the pedestrian who is about to cross, and be accompanied by "audible pedestrian signals" (APS).

Policy 2.3, Shared Streets. Consider shared streets as a traffic calming device where a plaza setting would best serve the needs of pedestrians, while allowing access by small volumes of slow auto or bus traffic. Also consider shared street treatments where significant numbers of bicycles and motor vehicles mix but there is insufficient room for a separated bike lane.

a. The chapter on Major Projects recommends plazas with transit facilities and slow traffic on the east side of Shattuck Square and on Milvia in front of the Civic Center Building.

b. Consider shared street treatments on Allston Way, where high levels of bicycle and pedestrian traffic are present but access by motor vehicles should be provided. Shared street features might also be appropriate to portions of Center Street and would be essential for slowing traffic to safe speeds if a decision is made to remove bicycle lanes.

c. Shared streets should be designed to alert drivers, pedestrians, and bicyclists that they are leaving a conventional street environment and entering a pedestrian-priority space by using special paving and vertical deflection features (gradual enough to avoid injury to persons with disabilities who are riding in vehicles), and other indicators. To maintain plaza paving throughout, bollards and concrete planters should be used instead of curbs, to protect buildings, landscaping and street furnishings.

Policy 2.4, Connections & Amenities on Private Property. Consider ways to enhance the pedestrian realm beyond what can be attained through public improvements.

a. While the SOSIP addresses public improvements on City land, the public realm is affected by the way buildings address public spaces and by public access to private plazas and midblock passages. Consider revisions to Berkeley's Zoning Ordinance and Downtown Design Guidelines to encourage:

- publicly accessible private plazas and midblock passages;
- window and entry patterns that provide a sense of inhabitation and discourage inappropriate behavior;
- private activities that help make streets and public open spaces more vibrant; and
- solar access to major public open spaces.

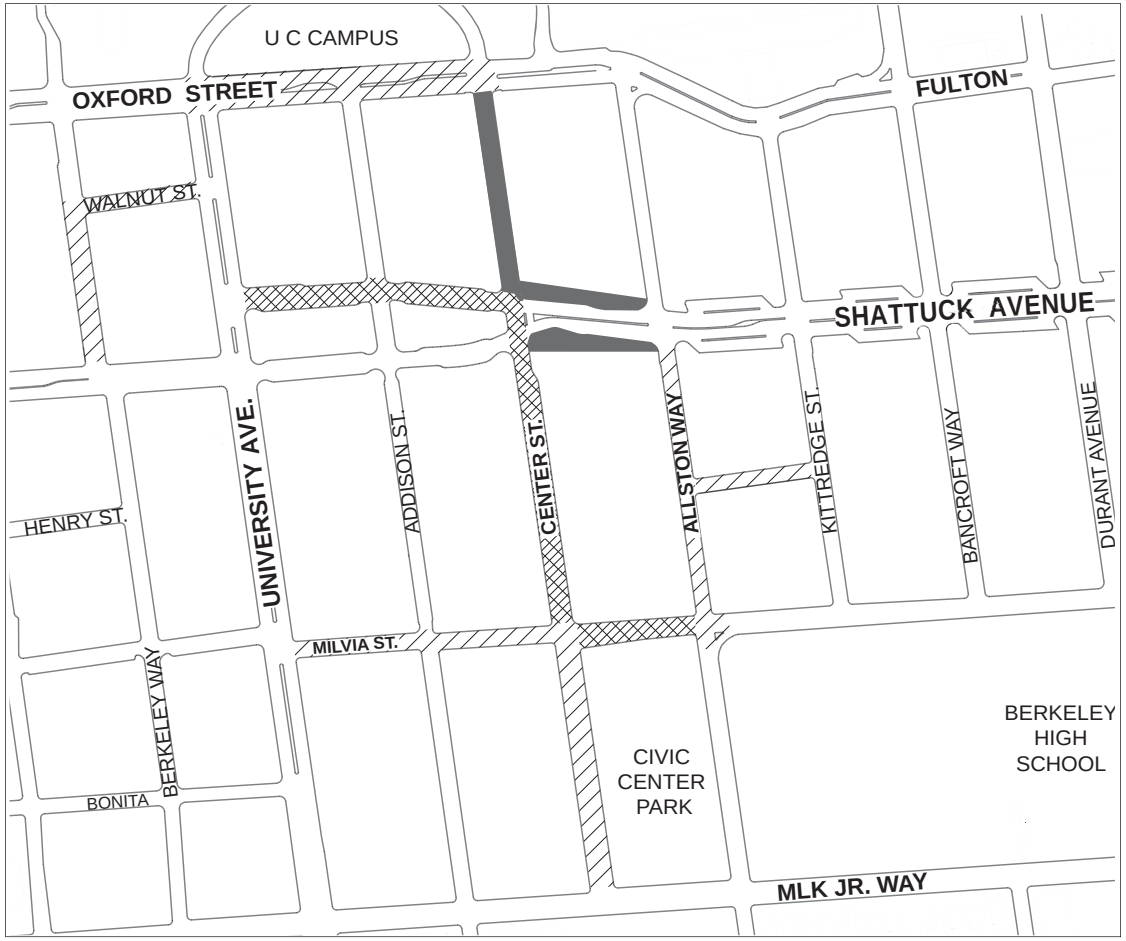


Figure e.7. Potential Shared Streets Locations.

SHARED STREETS

A shared street removes features that typically segregate vehicles from each other and from pedestrians, so that all road users are more equal with each other. There are fewer signs, lane markings, and traffic lights, which de-emphasize rigid expectations that cars and people can't mix.

Where applied, the result has not led to more accidents but rather fewer accidents result because everyone yields. Cities that have embraced shared space concepts have witnessed significant decreases in crashes–up to 40%-60% fewer crashes. People entering shared streets experience an elevated sense of awareness. Eye contact increases and motorists modulate their speed to fit conditions.

A European Union pilot of seven shared street projects showed improvements in safety, livability, economic development, and sense of place. Streets serve an important social function as they are the principal space in which we engage other people, but modern practices have focused instead on how people – and especially motorists – can move through spaces quickly and without intermingling. The ideal has been to keep pedestrians completely separate from traffic, which has resulted in faster vehicle speeds and long circuitous routes for pedestrians. Shared streets maintain some separation (with emphasis on safe zones for people with disabilities) but give emphasis to readily understood social norms and human interaction.

In addition, vehicle travel times on shared streets appear to be less than with conventional engineering. While yielding to pedestrians slows motorists, long waits at traffic lights are eliminated.

Where shared streets have been implemented, they were not readily accepted. Sophisticated modeling, pilot projects, and short-term trials were needed to eliminate objections -- a long-term process that required a shared commitment to satisfy functional and safety concerns without presupposing a standard solution.

Figure e.8. Mixing Modes. *Plaza-like features can be used to pedestrianize spaces while also allowing bicycles and motor vehicles. Motorists are presented with conditions that cause them to slow and yield as needed.*

BICYCLE NETWORK & FACILITIES

BICYCLE NETWORK & FACILITIES

PRINCIPAL CONSIDERATIONS

Bike Activity. For many Berkeleyans, bicycling offers an excellent way to get around and get Downtown. Approximately 3,362 people bike to work in Berkeley every day (2008 – 2010 American Community Survey), which represents 8% of all commuters, the fourth-highest in the nation. In addition, about 4,200 individuals bike to work or study at UC Berkeley each day, with 21 percent of bike trips originating within Berkeley (UC Berkeley Bike Plan, 2006). However, travel to work constitutes only a relatively small part of daily transportation for shopping, recreation or other trip purposes. Bicycles are used for these additional trips as well, as they can cover similar distances as many cars trips at nearly the same speed and at a fraction of the cost.

Bike Network Connectivity. Downtown is served by a variety of bicycle lanes, routes, "Bicycle Boulevards," and other bicycle facilities, but the network envisioned by Berkeley's Bicycle Master Plan is incomplete. While Milvia, Berkeley's first "Bicycle Boulevard" offers a protected route for bicyclists traveling from the north or south, there is no continuous bicycle lane between University Avenue and Allston. In the Southside Area, Fulton provides a protected bicycle route south of Dwight but where Fulton becomes one-way southbound, bicyclists traveling north must divert to Shattuck or Ellsworth before getting to Dwight. In addition, bicycle facilities along the Ohlone Greenway on Hearst stop at reaching Shattuck before reaching Oxford and the UC Campus.

From central and west Berkeley, bicyclists often use Channing or Allston Way to get across Martin Luther King Jr. Way. But while Channing remains bike-friendly through Downtown, Allston Way has destinations that also attract motorists whose speed often exceeds what would be optimal for bicyclists, and the absence of a traffic signal at Oxford makes the trip from Allston to the UC Campus difficult. Allston has a higher rate of collisions involving bicycles than other Downtown streets, except Shattuck Avenue.

Special consideration is needed for the segment of Center Street between Shattuck and Civic Center Park, which has bicycle lanes to enhance the safety of bicyclists traveling to Berkeley City College, BART, and the UC Campus. This street segment also has the potential to become a "greenway" that establishes a landscaped connection between Civic Center Park, Center Street Plaza, and the UC Campus, and is included in the Bicycle Network adopted in the City's General Plan and in the Bicycle Plan. The SOSIP provides alternatives for future design development and analysis to determine how to maintain safety while simultaneously enhancing Downtown as a "green destination."

Use and Safety along Shattuck. Shattuck presents another challenge for bicyclists. Shattuck has high volumes of bicycle traffic because it offers a direct route through Downtown and to Downtown destinations. Bicycling is challenging on Shattuck because many bicyclists mix with heavy motor vehicle traffic on this major corridor, much of which travels above the posted speed limit. In addition, some bicyclists collide with pedestrians because they ride on sidewalks – which is not

Facing Page: Biking in Downtown. *Bicyclists ride in great numbers to get to Downtown destinations and in passing through.*

Figure f.1. Riding on Sidewalks. *In spite of signage and enforcement, bicyclists ride on sidewalks because car and truck traffic can be intimidating.*

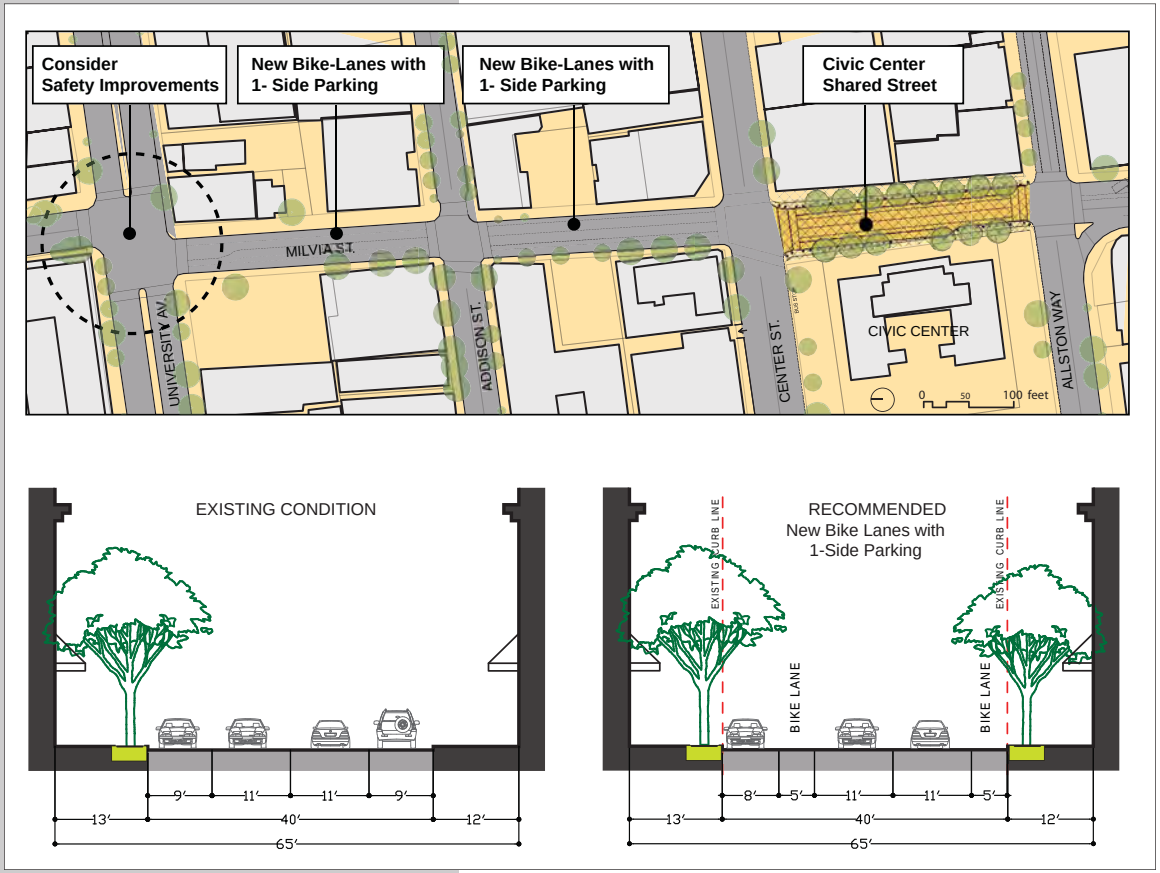


Figure f.2. Milvia Bike Improvements. *Class 2 bicycle lanes would be created on Milvia between University & Center by eliminating parking on one side of the street.*

legal, but occurs at least partly because riding on the street can be intimidating.

Bike Parking. Bicycle parking facilities are in high demand. New parking has been introduced in recent years including the opening of the storefront "Bike Station" on Shattuck in 2010. Still, bike parking remains in high demand -- especially near major destinations. Consideration also needs to be given to bike sharing and bicycle rental programs that are inexpensive, convenient and located near transit. Bicycle rentals and "bikesharing" programs can reduce the demand for bicycle parking by providing bicycles "on demand".

Analysis & Design. Dimensions of travel lanes and other features that are noted in SOSIP graphics and narrative are subject to further analysis and refinement. (See Major Projects chapter Policy 1.5, Analysis & Design).

Relationship to Other Documents. Users of this Plan should also refer to the Municipal Code, Pedestrian Master Plan, Bicycle Master Plan, and Transportation Element of the General Plan. If a provision of this Plan conflicts with one of these documents, the other document shall govern unless and until it is amended by Council.

POLICIES AND ACTIONS

Policy 3.1, Network Connectivity. Make bicycling safer and more convenient in and through Downtown by making improvements to the bicycle network. Consider bicyclists of all ages and abilities.

a. Milvia Street. Establish continuous bicycle lanes along Milvia between University Avenue and Allston Way. Consider the elimi-

nation of the right-hand vehicle “slip lane” on the southwest corner of Milvia and Allston, and consider pavement markings for bicyclists at Milvia and University. In recognition of high motor vehicle volumes, accompany bicycle lane improvements with traffic calming features. Consider traffic calming features that also have ecological benefits (see Watershed Management & Green Infrastructure). In the long term, create a shared street / plaza in front of the Civic Center building.

To establish bike lanes on Milvia between University and Center Street, on-street parking would need to be removed on the west side of the street where on-street spaces are also limited by multiple curb cuts and red zones. Avoid a net loss of parking by increasing the availability of nearby parking —such as by providing direct access from the Golden Bear parking lot to Milvia, and/or converting reserved spaces along Civic Center Park to metered spaces. (See Policy 1.18, Zero-Net Parking.)

b. Hearst Avenue. On Hearst Avenue, bike lanes should be extended from west of Shattuck Avenue to the UC campus (see Hearst Street / Ohlone Greenway Extension discussion under Major Projects).

c. Fulton Street Contraflow Lane. Consider establishing a northbound contraflow lane on Fulton between Dwight Way and Durant Avenue. Fulton Street is an attractive bicycle/route south of Dwight Way, but bicyclists traveling north are presently diverted before Dwight where they encounter one-way southbound traffic. Note also that Fulton bike lanes would reduce bicycle traffic on Shattuck. On-street parking would need to be removed to create a

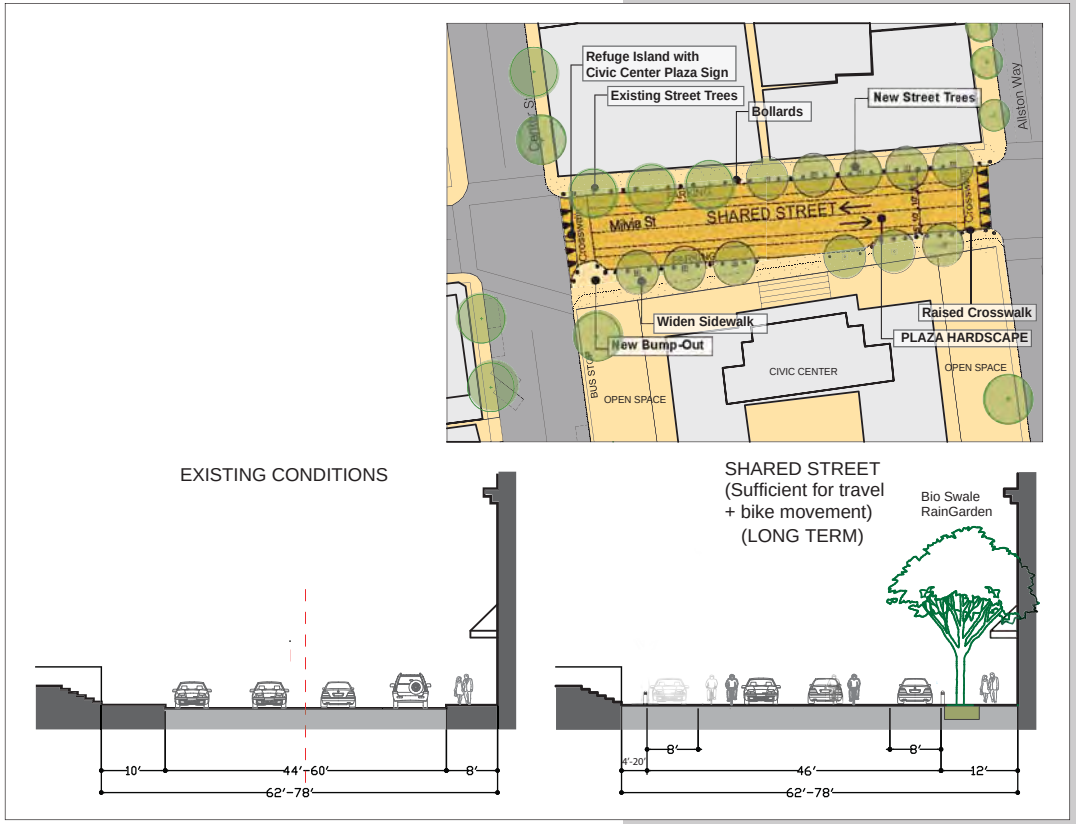
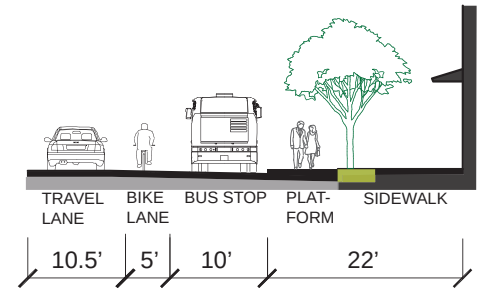


Figure f.3. Civic Center Plaza Improvements. *Class 2 bicycle lanes might be created on Milvia between University & Center by eliminating parking on one side of the street.*

ALT1.
BIKE LANE BETWEEN
BUS STOP AND TRAVEL LANE



Note: Dimensions subject to further analysis

ALT2.
BIKE LANE BETWEEN
BUS STOP AND SIDEWALK

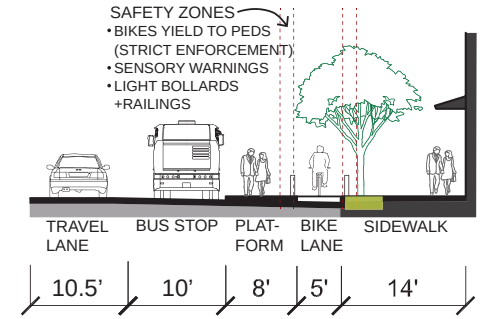


Figure f.4. Bike Lanes & Buses. *While bike lanes are desirable along Shattuck, Shattuck is also a transit priority street and conflicts with buses should be minimized. The cross-sections above study what the relationship between buses, bikes, and pedestrians might be at bus stops. For plan view: refer to figures f.5 & 6.*

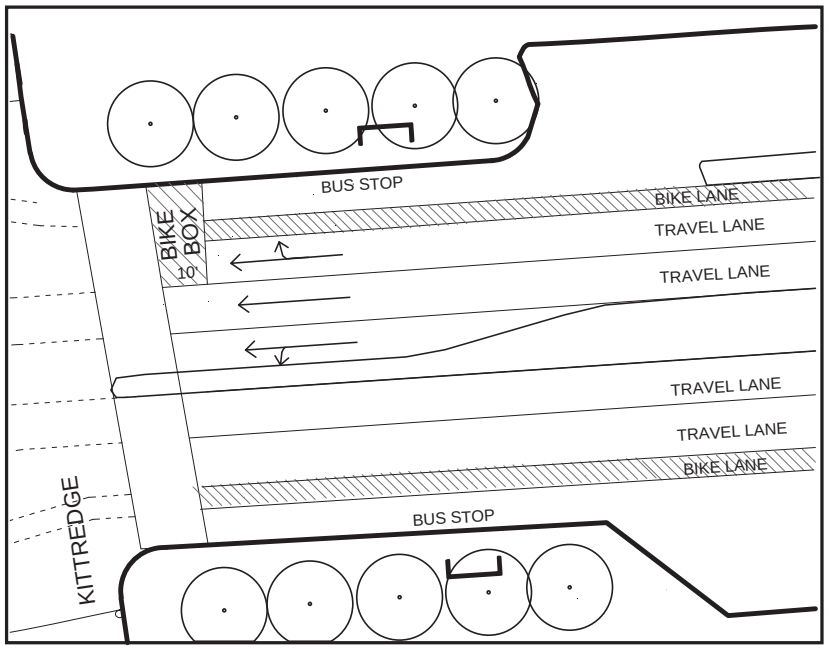


Figure f.5. Shattuck Bike Lane/ Bus Stop Study *(for future evaluation). A bike box would allow bicyclists to move through intersections quickly and ahead of the bus. Bike boxes work best at intersections with a high volume of bicyclists.*

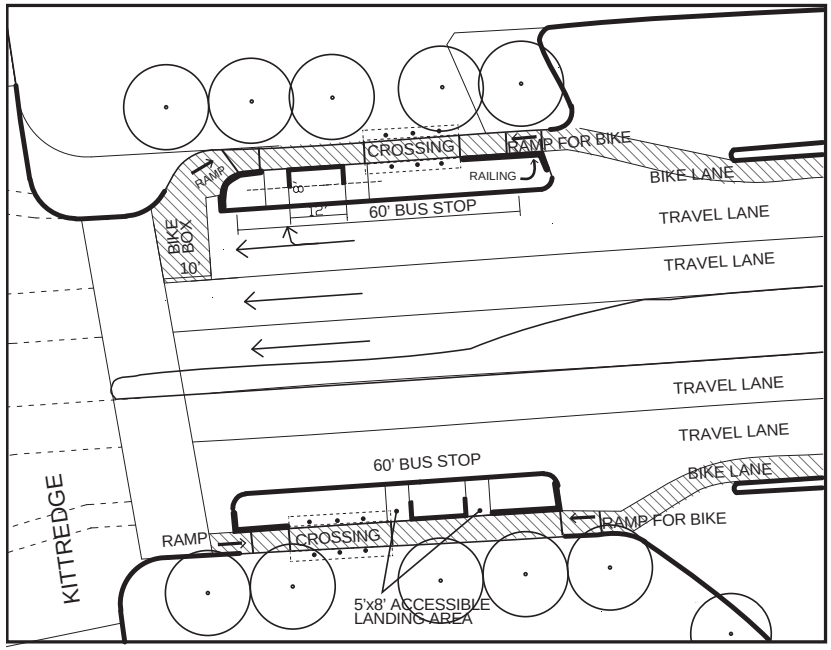


Figure f.6. Shattuck Bike Lane / Bus Stop Study *(for future evaluation). Bike lane behind existing bus stop could also avoid bus-bike conflicts at intersection.*

Figure f.7. Bike Boxes. *Bike boxes put bicyclists in front of motor vehicles at intersections. Bike boxes improve bike safety and can enhance a street's overall performance.*

Figure f.8. Minimizing Bike-Bus Conflicts. *In Portland, Oregon, bike lanes pass behind some transit stops to enhance bicyclists' safety and transit operations. Bicyclist must yield to pedestrians in these situations.*

contraflow bicycle lane. Avoid a net loss of parking, consistent with Policy 1.16, Zero-Net Parking Strategy.

d. Allston Way. Extend Class 2.5 Bike Route to Oxford in recognition of significant bicycle volumes. Consider ways to calm vehicle traffic on Allston Way, such as through the use of "speed tables" and shared street features. Consider installing a bike-activated traffic signal at the Allston/Oxford intersection and better connecting bike lanes and paths of travel near that intersection to support bicycle travel from Allston Way to the UC Campus.

e. Shattuck Avenue. Shattuck should be reconfigured to become a "complete street" by adding bicycle lanes south of Center Street. Grade-separate these new bike lanes where feasible. Consider probable conflicts between bicyclists, buses, and other vehicles, and mitigate potentially dangerous conditions. Consider features such as "bike boxes" at intersections, queue jump signals for bicyclists, bike lanes that pass behind bus stops, dashing striped bike lanes, signing where vehicles blend to indicate where bikes may not have the right-of-way, and using "far-side" bus stops so that buses can always pull through intersections before stopping. Continue to enforce laws that prohibit bicycle riding on sidewalks. (See also Major Projects, Policy 1.8, Shattuck Boulevard).

f. Center Street Greenway. Evaluate how to best provide for the safety of bicyclists and pedestrians while also providing a greenway that establishes a landscaped connection between Civic Center Park, Center Street Plaza, and the UC Campus. The Major Projects chapter presents options for Center Street between Shattuck and Milvia.

Figure f.9. Bicycle Parking. *Bicycle parking should be increased Downtown. One way to do this is to set aside curbside spaces for bikes by using bollards.*

Figure f.10. Bike Sharing. *Bike sharing provides convenient short-term bicycle rentals – often with the swipe of a credit card – and will support car-free access from Downtown to the UC Campus and other areas.*

g. Shattuck Square & University Avenue. Consider how bicycle facilities might be incorporated into eastside Shattuck Square and end of University Avenue improvements, so as to further enhance Berkeley's bicycle network.

Policy 3.2, Bicycle Parking. Increase the supply of convenient, secure and attractive short-term and long-term bicycle parking throughout the Downtown Area, but especially near major destinations.

a. Identify potential locations for new bicycle parking facilities and work with surrounding stakeholders to determine preferred locations. Use this analysis when installing bicycle racks.

b. Consider converting on-street car parking to bicycle parking in locations with high demand, since one 20-foot car stall can accommodate up to 12 bicycles without occupying sidewalk space. In these locations, bike racks should be placed such that parked bikes are perpendicular to the curb. Bollards should be used to delineate and protect bicycles from vehicle lanes.

c. Position bicycle racks to avoid obstructing pedestrian flows and should conform with criteria contained in Berkeley's Bicycle Plan and Bicycle Parking Specifications (2008).

d. Consider ways that bike racks can be used for artistic expression (see Public Art chapter).

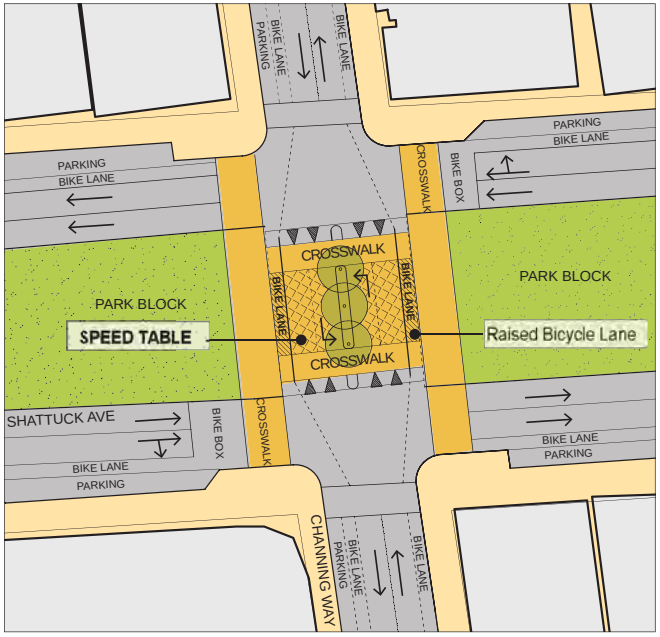


Figure f.11. Bike Lanes and Speed Table on Shattuck Avenue at Channing Way.

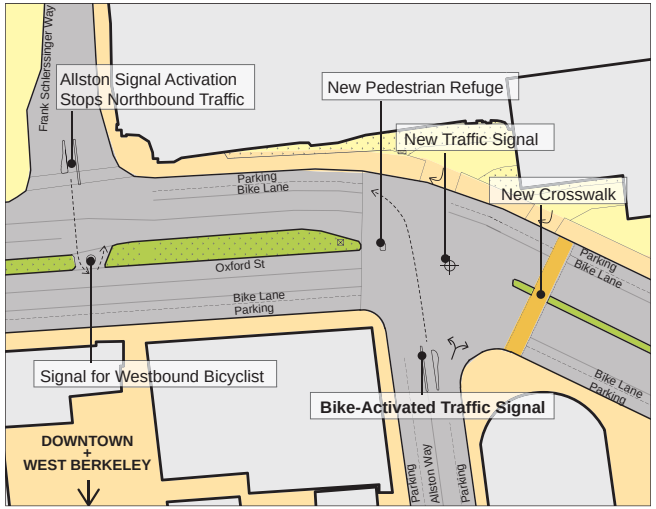


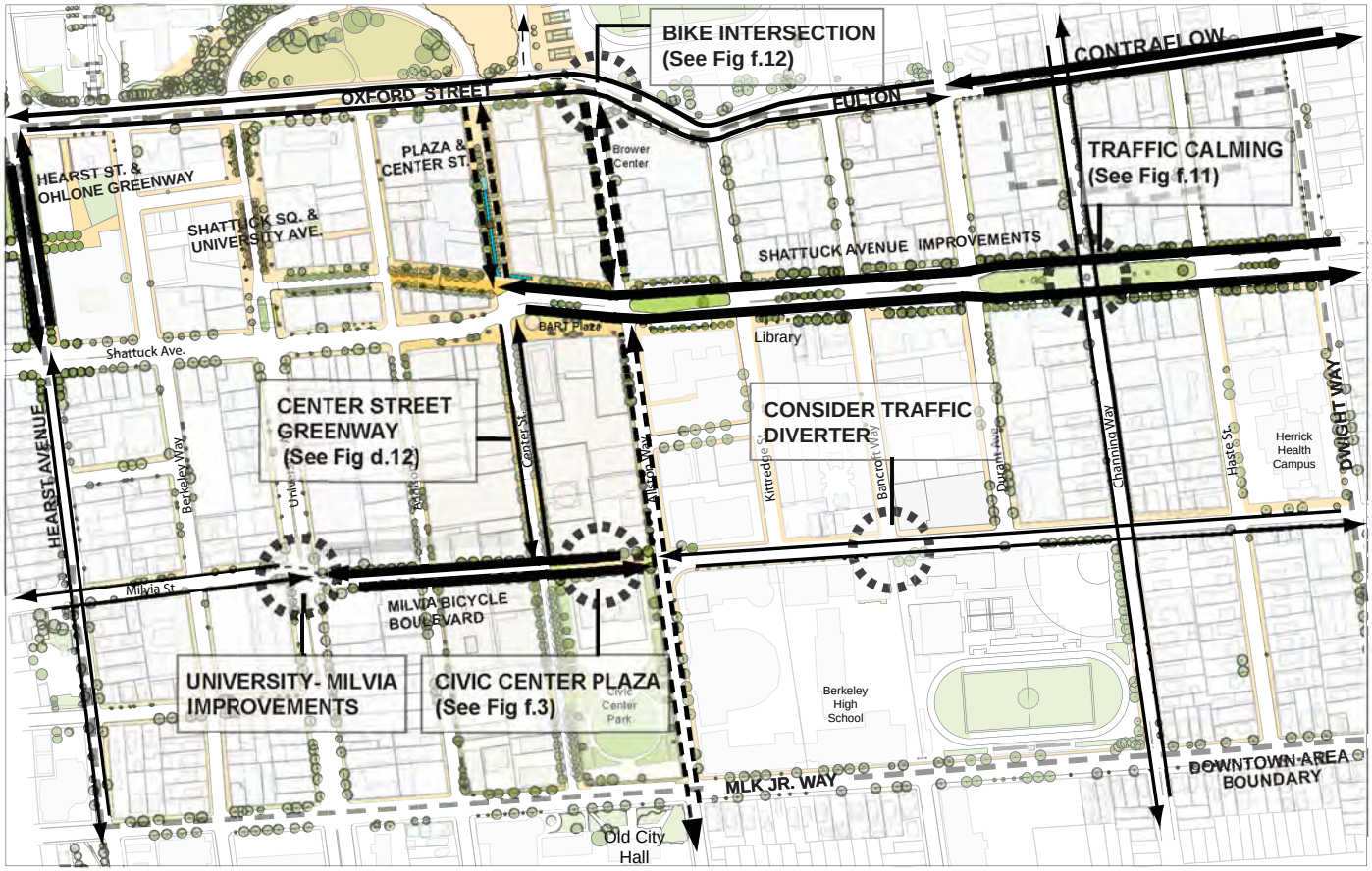
Figure f.12. Bike Intersection Studies on Oxford Street at Allston Way. *Allston can be improved as a bicycle route to the UC campus through the intersection improvements illustrated.*

e. Provide adequate sheltered and attended parking options, and support their on-going operations.

Policy 3.3, Bike Sharing. Encourage the creation of "bike sharing" (i.e., convenient bike rental) programs in Downtown, and their use by employees, residents, and visitors, especially near BART.

a. Identify criteria for the design, program, and location of bike sharing facilities, by examining existing programs in North American and Europe. Solicit proposals from bike share providers for facilities consistent with these criteria.

Figure f.13. Recommended Bike Network.



WATERSHED MANAGEMENT & GREEN INFRASTRUCTURE

WATERSHED MANAGEMENT & GREEN INFRASTRUCTURE

PRINCIPAL CONSIDERATIONS

SOSIP's focus on Green Infrastructure can be a role model for watershed health. SOSIP recommendations articulate a general strategy for Green Infrastructure in Downtown, but note that concepts in SOSIP will need to be developed further through the collaboration of engineers, urban designers, landscape architects, merchant representatives, and others. In addition, Green Infrastructure designers should always refer to the Department of Public Works for technical standards and guidance.

Urban Runoff Challenges

When it rains, runoff can pick up contaminants from the air, rooftops, or the land prior to its discharge into storm drainpipes, creeks, and eventually the Bay. Runoff is also generated when landscaping is over irrigated or cars are washed. Considerable pollution comes from urban runoff contaminated by dripping oil pans, tires debris and other sources. Street run-off also includes metals, pesticides and litter -- especially non-biodegradable plastics. Urban runoff is now one of the greatest contributors to degraded water quality in the Bay.

Runoff rates and volumes increase proportionally with impervious surface area within a watershed. Through conventional stormwater conveyance measures, runoff is quickly collected, conveyed by storm drainpipes, and creeks to the Bay. Consequently, water converges in some locations at nearly the same time, where peak flows in some locations exceed available capacity, resulting in surface ponding and flooding. This approach fails to recognize how larger watersheds function hydrologically and ecologically, and misses opportunities to use stormwater as a valuable resource.

Facing Page: ***"Rain gardens"*** *provide a place where urban runoff can flow and be filtered by plants and soil, as is illustrated by this rain garden in Portland, Oregon. Staff photo.*

Watershed Approach & Green Infrastructure Strategies

Green Infrastructure strategies to manage stormwater and watersheds are being implemented across the nation to address the challenges outlined above and many other community needs. Green strategies emphasize landscape-based green Infrastructure features designed to absorb, evaporate, store, and slow runoff, while filtering out pollutants. The general approach is to increase evapo-transpiration from plants, store water in cisterns, and encouraging infiltration where permeable soils allow it.

As runoff percolates through the vegetation, and other natural media (gravel, mulch, sand, soils) that is often associated with Green Infrastructure, pollutants are removed by physical, chemical, and biological processes. This offers pre-treatment of the runoff prior to its entrance into storm drainpipes or creeks. Additionally, Green Infrastructure can reduce peak flows downstream by detaining and diverting runoff away from existing stormwater infrastructure.

Modest Green Infrastructure features placed close to where run-off first occurs can be more functional and less expensive than using larger more centralized features downstream. Green Infrastructure reduces the need for piping, inlet

Figure g.1. Urban Runoff. *Urban runoff includes rainwater that washes motor oil and other pollutants off of streets and into storm sewers. Green Infrastructure can filter these pollutants and improve water quality downstream.*

Figure g.2. Downstream Flooding. *Green Infrastructure can retain rainwater, and become part of strategies to reduce flooding downstream.*

Figure g.3. Eco-Parks. *"Eco-parks" contain low-lying areas to receive and treat urban runoff. Eco-parks offer an opportunity to educate the public about watershed issues. They can have a natural appearance as in Portland Oregon (top & center), or a formal appearance as in Santa Barbara (below).*

structures, downstream detention facilities, and other traditional engineered facilities, as well as reduce a creek's exposure to erosive flow conditions. Stormwater detention and conveyance at the surface is generally less expensive than underground solutions. Green Infrastructure also simplifies maintenance and makes many problems easier to detect.

Leveraging Co-Benefits

Beautification & Traffic Calming. Green Infrastructure also offers significant co-benefits. The Downtown can be beautified while addressing environmental concerns. Vegetation can be used to reduce pollutants and will bring more green to the Downtown, while permeable paving can replace mundane asphalt with visually appealing surfaces.

Greenery and special pavers can support Downtown as a focal point for community life. Furthermore, Green Infrastructure makes environmental stewardship more visible, and should enhance Downtown's image and promote Downtown as an eco-destination. Studies suggest that "[t]he greening of Downtown will increase positive perceptions of Downtown and draw more customers. . ." (Project Evergreen, 2008, as cited in San Mateo Guidebook).

Green Infrastructure features can also be used for traffic calming, such as through the use of permeable pavements and curb extensions. Pavers create visual changes that alert motorists that they are entering a pedestrian-oriented city center. Curb extensions reduce distance for pedestrians crossing streets and also slow motor-vehicles by reducing width of street. Care should be given to select pavement materials that are suitable for persons with wheelchairs.

District-Scaled Opportunities. As a larger district, the Downtown Area straddles the Potter and Strawberry watersheds. Each watershed presents unique opportunities for retaining rainwater in cisterns, so that it can be reused for irrigation. At the surface, rainwater in the Downtown flows south and west. In principle, water that falls on Downtown might be collected and stored where it could be used for landscaping and as a back-up source of water for emergencies – a strategy employed in San Francisco.

Downtown Berkeley has relatively small parcels for development , which will make it difficult to fit large detention features on-site; meanwhile the public rights-of-way adjacent to development present opportunities for detention features and other Green Infrastructure. One possible approach would allow developers to meet regulatory stormwater requirements by paying a fee in lieu of on-site improvements. In lieu fees would be combined with other sources of financing to make public improvements on adjacent streets and within the watershed to which Downtown is connected. This approach would better leverage private capital by connecting it to the most advantageous opportunities in public parks and rights-of-way.

Improvements on public land and on private sites might be cooperatively planned for higher performance and cost effectiveness. For example, the downspouts of a privately-owned building could convey runoff to bio-retention basins on public rights-of-way, and then to below-grade storage (cisterns) for later non-potable reuse within the private building setbacks.

The scale of Downtown also presents special advantages. In Santa Fe, New Mexico, the Railyards Park has a cistern that collects runoff from hardscaped plazas; a photovoltaic powered pump then lifts this water into a water tank,

which provides adequate pressure for irrigating landscaped areas. Consideration should be given to similar strategies in the Downtown Area, which is comprised of subareas similar in size to the Railyards and may offer suitable rights-of-way and open space opportunities.

Regulatory Background

The City of Berkeley is a co-permittee under the Alameda Countywide Clean Water Program's NPDES permit, as required under the Federal Clean Water Act. As a co-permittee, the City has individual program and permit responsibilities to reduce the discharge of pollutants in stormwater by: adopting effective standards; educating the public; performing street sweeping and storm drain maintenance; controlling erosion, etc. In addition, State-mandated water quality standards for urban runoff are becoming more stringent, which makes implementing appropriate runoff management and of Green Infrastructure increasingly urgent.

Context-Sensitive Design

Urban Setting. Downtown is covered largely by impermeable surfaces while simultaneously being the source of many pollutants. This circumstance makes the twin goals of reducing peak flows and treating runoff especially important. Street rights-of-way cover 40% of the Downtown Area, and are dominated by concrete and asphalt areas that drain the street. On commercial properties, gutters that drain roofs often discharge to streets. Downtown also accommodates heavy traffic and commercial activities that make Green Infrastructure critical.

Some Green Infrastructure are better suited to dense mixed-use places like Downtown, where land is used intensively be appropriate in Downtown's commercial areas, where space comes at a premium.

Converting Paved Areas. Downtown is largely covered by impervious surfaces including asphalt, concrete and buildings, but numerous opportunities for permeable surfaces and Green Infrastructure exist. Traffic analysis for Downtown has confirmed that portions of Shattuck Avenue that have 6 travel lanes can be reduced to 4 travel lanes -- without adding to traffic congestion. The segment of University Avenue from Shattuck Square to Oxford can be reduced from 4 lanes to 2 travel lanes, as can Hearst Avenue from Shattuck to Oxford. Diagonal parking and parking aisles along Shattuck might be reconfigured as parallel parking, thereby halving the asphalt per parking space from 330 to 160 square feet. Finally, Downtown has many red zones where curbs might be extended and Green Infrastructure added.

Clay Soils. Downtown's natural conditions need to be factored into Green Infrastructure decisions. Nearly all of Downtown is underlain by clay soils and silts, and infiltration strategies where water percolates into native soils are generally infeasible. Outflow features will often be needed in conjunction with subsurface collection – such as through below-grade

5 While environmental impacts from Downtown are significant, it is also important to recognize that impacts from high-density urban areas are less than if the same amount of develop occurred at lower densities – when measured at the scale of whole systems. EPA's "Protecting Water Resources with Higher Density Development" notes that not only to low-rise buildings cover more land than taller buildings, but low-density development also requires more impervious infrastructure like roads and parking lots. In addition, most green areas in low-density development has been created on soil that has been disturbed during development -- and is therefore compacted and far less pervious than undisturbed natural and agricultural lands.

use of permeable substrates and other features to increase detention volumes.

Slope. Consideration must also be given to Downtown's topography. Downtown slopes by 1-2% along north-south streets and 2-5% along east-west streets. Erosion can be an issue when there is drainage across slopes exceeding 1%. When water moves at the surface in the east-west direction, features, like weirs (i.e. "micro-dams") will be needed to slow water and dissipate its energy.

Climate. The Bay Area's Mediterranean climate must also be considered. A dry season extends through the summer and into the early fall, while winters can be extremely wet. Temporary irrigation and careful plant selection are critical concerns for vegetated green infrastructure measures which will not receive natural watering for a majority of the year. During the dry season, dust, pollutants, trash and debris accumulates on roads and other hard surfaces. When rain arrives, the "first flush" of the rainy season generally produces higher concentrations of contaminants – even though the volume of water from these first rain events may be modest. Year-round Street sweeping also plays an important role in reducing first flush impacts.

Utilities. The location of subsurface utilities and building services are critical for evaluating the location and appropriateness of particular facilities. In addition, the BART station mezzanine is located close to the surface between Addison and Allston. BART tracks run down the center of Shattuck and may limit some – but not all – Green Infrastructure options.

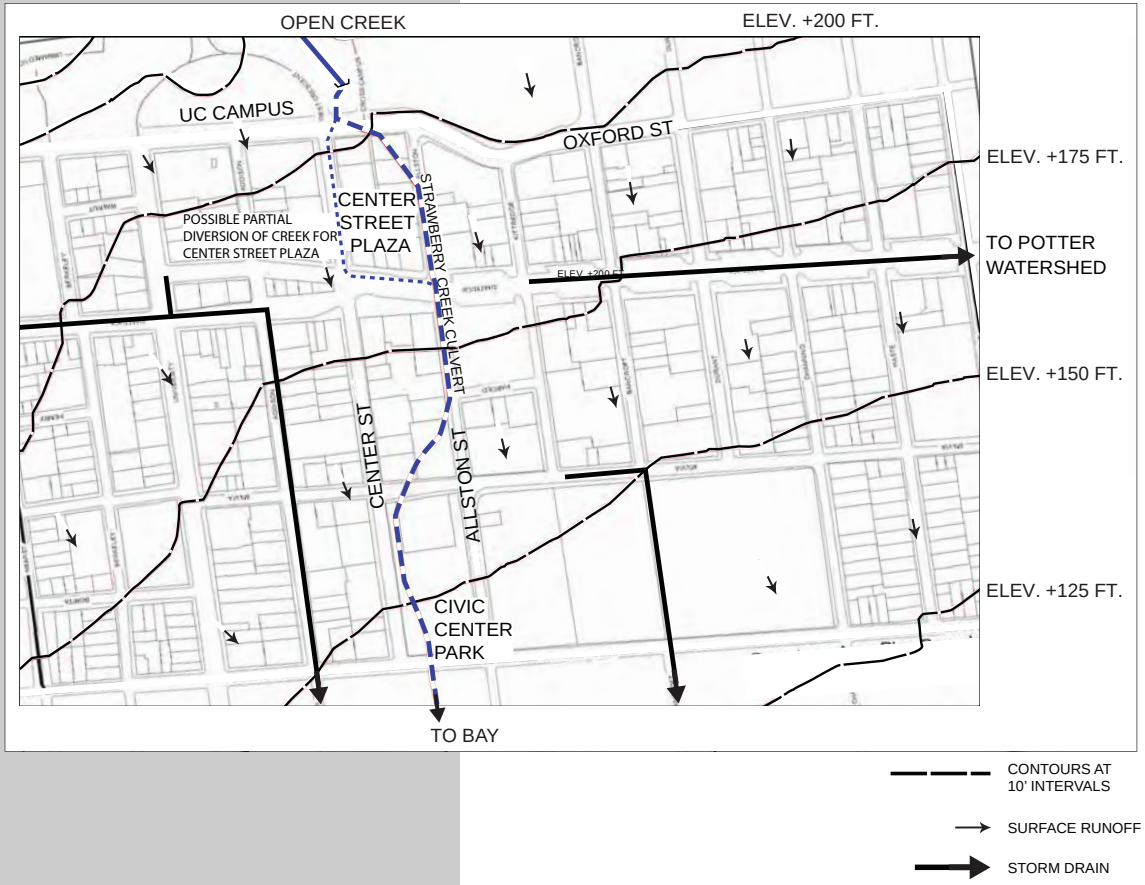


Figure g.4. Countours & Drainage (July 21, 2010).

Accessibility. Paths of travel must comply with the Americans with Disabilities Act (ADA), which will limit the type of Green Infrastructure selected in some locations, and may dictate how travel surfaces are finished.

Basements. Buildings in Downtown have basements and several buildings have basements that extend under sidewalks and possibly into public rights-of-way. The potential for disturbing basements directly or through the infiltration of water should be considered, so that possible impacts can be mitigated.

Green Infrastructure Performance & Types

Each Green Infrastructure feature performs differently and each is more-or-less suited to address one or more of the following. Figure ## depicts potential locations for Green Infrastructure, where sufficient space could be provided and topography is factored. The location, type and size of facilities should be decided during the design of major improvements in close consultation with the Department of Public Works.

Filtration & Absorption. Some Green Infrastructure measures filter or absorb pollutants contained in urban runoff, such as automotive fluids, pesticides, cleaning solutions, and metals. As runoff soaks into the site, larger contaminants like litter are left at the surface for easy collection.

Detention. Some Green Infrastructure measures temporarily hold or slowly meter the discharge of runoff which can reduce peak flows and downstream flooding. These Green Infrastructure include “rain gardens” that hold a few inches of water above grade, bio-retention trenches that hold water below grade, and properly-engineered permeable pavements and structural soils.

Retention & Infiltration. Retention measures divert water from the storm drain pipelines and creeks by impounding runoff rather than conveying it. Infiltration facilitates retention by having diverted water sink into the ground. Infiltration is limited to locations that are underlain by soils that have some permeability and are not over-compacted. The clay soils that underlay most of Downtown are impermeable, and would require expensive engineering to attain modest infiltration. Consequently, infiltration features are generally not recommended by the SOSIP.

Evapotranspiration. Significant amounts of water can be diverted through evaporation associated with landscaping and porous surfaces. Tree canopies also capture water on leaves, and some of this evaporates before reaching the ground. Vegetation also absorb and transpire large quantities of water, and some trees intercept and absorb hundreds of gallons of water a day. Through this process, pollutants in urban run-off can be absorbed, and reduce downstream flows.

Local Conveyance. Conveyance features may be used to gather and direct run-off to Green Infrastructure. Conveyance features, such as pipes, may be used to direct water to bio-retention basins or rain gardens, which may present a more cost-effective option than extensive use of permeable paving. Channels, and shallow gutters and runnels, reduce the need for pipes and can help reduce costs. In addition, some conveyance features slow runoff, such as textured pavement. Conversely, detention features become conveyance features when they overflow during the heaviest rains.

Figure g.5. Rain Gardens. *Urban run-off can drain into rain gardens, small flow-through planters that filter pollutants and retain water. Rain gardens can be located along curbs (top & center) or incorporated into plazas (below).*

Features on Private Parcels. Effective watershed management also requires participation from the private sector, including locating green infrastructure features on private development. These features can include on-site landscaping and green roofs. While the SOSIP focuses on public improvements, the SOSIP also describes a comprehensive district-wide approach that should be considered as development standards and design guidelines are revised.

POLICIES AND ACTIONS

Policy 4.1, Green Infrastructure Priorities. Green Infrastructure features should promote the health and function of watersheds within which they are sited. Green Infrastructure should be considered whenever street or open space improvements may be made, but should also be coordinated to leverage benefits.

a. Green Infrastructure should be incorporated into all major subarea projects, and should be considered throughout the Downtown Area as part of landscaping and traffic calming improvements.

b. Consider which types of Green Infrastructure investments and locations might best leverage benefits within the Strawberry and Potter watersheds.

c. A diagram of potential Green Infrastructure features is included in a Green Infrastructure Concept diagram, as depicted in Figure g.9.

Policy 4.2, Function & Location. Green Infrastructure improvements should be coordinated to optimize benefits. The specific functional needs of a location should be addressed by the particular Green Infrastructure selected. Functional types for streets and open space include: filtration & absorption, detention, retention & infiltration, evapotranspiration, and conveyance. Also consult with the Department of Public Works as detailed design and engineering is undertaken.

Green Infrastructure approaches that are suitable for Downtown are described below. Guidelines outline key factors for considering the design of specific features relationships. Consult with the Department of Public Works as detailed design and engineering is undertaken.

Bio-Retention Features (including rain gardens & tree basins). Bio-retention features hold water and slow its flow, while also using soil and vegetation to absorb pollutants, transpire water, and, where possible, encourage infiltration. Bio-retention features basins do not require large areas. Bio-retention basins can be modest at the surface because they can attain an appropriate size through additional depth. As a consequence, bio-retention basins can be contained with relative ease within curb extensions and in other curbside locations – such as when excessive asphalt is replaced by wider sidewalks and other features. If the cross-slope of a street directs water towards a median, the median may present a bio-retention opportunity. Bio-retention features may not be appropriate near some basements and utilities. Bio-retention features must be designed to avoid the creation of mosquito habitat.

While typical soils become compacted when bearing loads, structural soils maintain small voids that allow water, air and roots to penetrate. Structural soils create a load-bearing matrix by using coarse gravel and stabilizing agents. Consequently, structural soils add stormwater storage capacity. While structural soils usually add to upfront installation costs,

these costs are offset by increasing tree survival, reducing pavement upheaval, and enhancing downstream performance.

Bio-Filtration Features (e.g. shallow swales and flow-through planters). Bio-filtration features use soil and plants to remove pollutants and sediments, but generally convey stormwater rather than retain it. Bio-filtration features convey water and are designed to detain only small amounts of water. Bio-filtration features do not need to be deep and are therefore well suited for locations with below-grade utilities and near basements. Bio-filtration features can be used to "pre-treat" runoff before it reaches bio-retention basins that might otherwise be compromised by sediments. Long narrow areas offer ideal locations for swales, and may include portions of the Center Street and Ohlone Greenway subareas. Bio-filtration features must be designed to avoid the creation of mosquito habitat.

Permeable Paving. Permeable paving has voids that allow water to infiltrate. Over most soils, permeable paving is accompanied by an underlying reservoir of gravel and stone, with filter fabric to prevent the reservoir from silting up.

Permeable paving may be applied to areas with no vehicle traffic or traffic at low speeds, such as parking stalls, sidewalks, "shared streets," and plazas. When permeable paving is to be used in association with below-grade retention, avoid locations with underground utilities and near basements. Select paving that provides a smooth surface for persons with wheelchairs.

Channels & Runnels. Channels and runnels are concrete or stone lined conveyance features that run along the surface. While they are not themselves Green Infrastructure, channels and runnels reduce the need for – and sometimes the size of – drains and subsurface pipes. They also make rainwater more visible and can be attractive visual elements. Runnels are shallow and accommodate modest flows, while channels are deeper and accommodate larger flows. Channels and runnels typically gather sheeting water and direct it to Green Infrastructure features, storm drains, or creeks. Runnels are a common feature in plazas, but also narrow streets and lanes. Channels can be seen frequently as part of curb extensions projects; channels allow runoff to drain properly through curb extension areas to maintain sufficient slope.

Water Storage (e.g., cisterns & "rain catchers"). Above-ground tanks and below-ground cisterns can be used to collect water from building downspouts and urban runoff that is sufficiently clean. Storage features can release collected water slowly. They can also be used to irrigate landscaped beds. Stored water can also play a vital role during disasters, when conventional water lines may be compromised. In San Francisco, below-grade cisterns that were installed in the early 20th century are still part of the city's emergency planning. Opportunities for storing water and using it for irrigation should be explored with all Major Projects. The City should cooperate with institutional and private property owners who are interested in diverting rainwater into cisterns, and the City should consider proposals for locating cisterns within public parks and rights-of-way if the water that would be stored would irrigate public landscaping.

Policy 4.3, District-Level Opportunities. Green Infrastructure and watershed management should be addressed at the scale of the Downtown Area and might extend into

Figure g.6. Tree Basins. *Bio-retention features can accompany new trees, but special engineering and tree survival concerns must be addressed.*

Figure g.7. Landscaped Swales. *Swales gather and convey rainwater. Small "check dams" can be used to hold water in small ponds and release it slowly.*

surrounding areas in recognition of watershed boundaries. A district-scaled approach should be used to leverage benefits more fully.

a. Further develop a master plan for Green Infrastructure Features as conceptualized in Figure g.9. Coordinate improvements address unique challenges resulting from relatively small parcels and high-intensity development.

b. Consider ways that rainwater could be stored and used to irrigate landscaping, for flushing toilets, or for use during emergencies as San Francisco has done. Because it is situated at a lower elevation, consider storage facilities in or near the Park Blocks.

c. Highlight the use of Green Infrastructure to reveal natural processes and communicate Berkeley's commitment toward sustainability. Use interpretive signage can to teach basic environmental principles and dispel misconceptions regarding Green Infrastructure. Consider demonstration projects to advance best practices in urban settings.

d. Private development standards and design guidelines should be refined to reinforce district-scaled strategies. Consider ways to encourage green roofs and other on-site infrastructure features. Allow fees to be paid in lieu of some requirements so that private funds can be used to construct improvements on public land, thereby leveraging additional benefits. (Developer fees are further discussed in chapter on Financing Plan.)

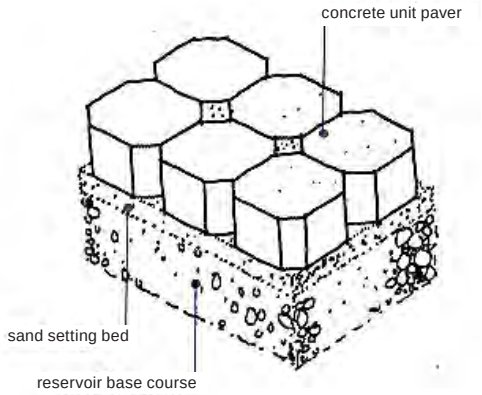


Figure g.8. Permeable Paving. *Permeable paving lets water through, to be gathered in below-grade basins or to infiltrate into the ground. Permeable paving must be accompanied by below-grade engineering.*

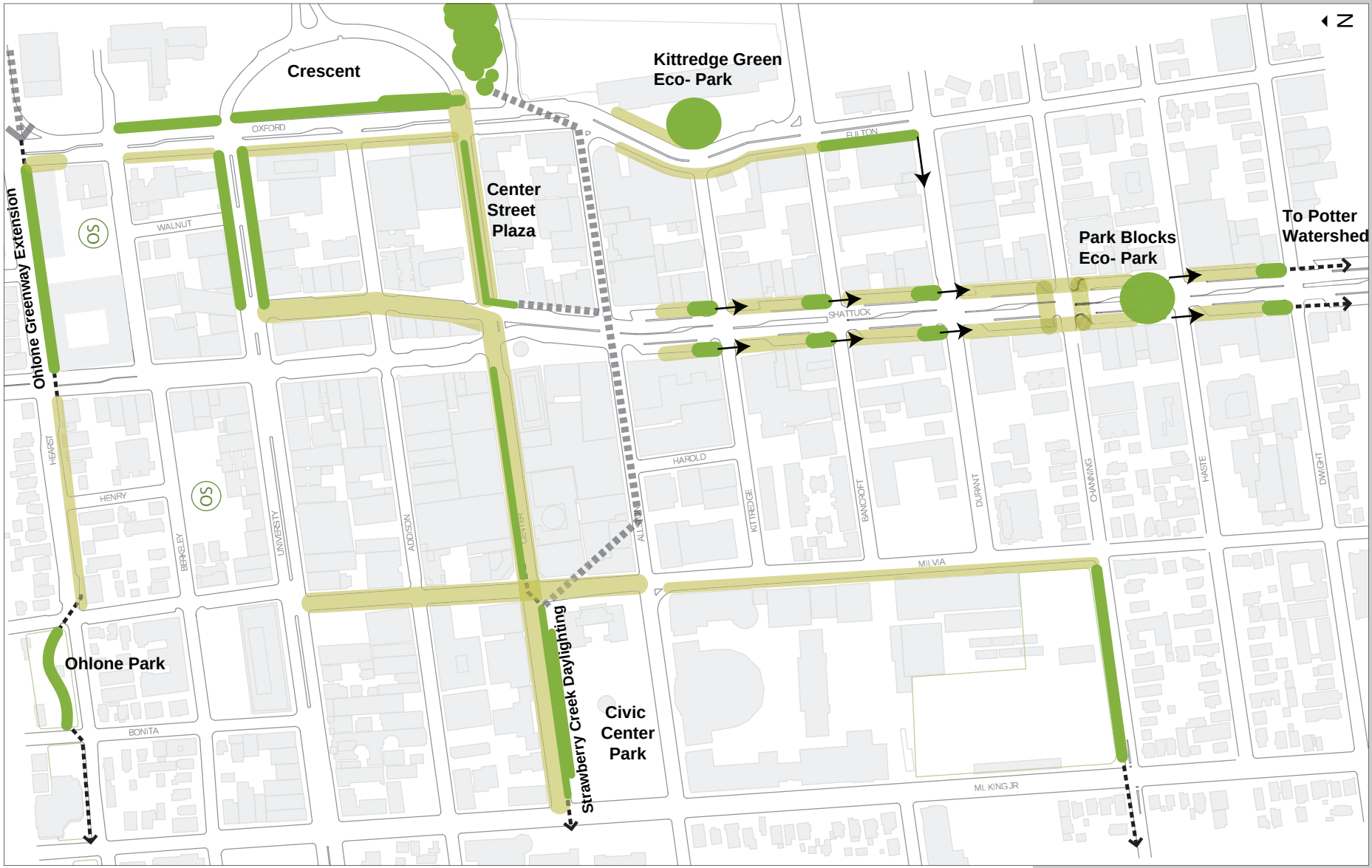


Figure g.9. Green Infrastructure Concept. *The diagram shown illustrates how SOSIP improvements could incorporate Green Infrastructure, possibly as part of an integrated strategy across multi-block areas.*

STREET TREES & LANDSCAPING

STREET TREES & LANDSCAPING

PRINCIPAL CONSIDERATIONS

Greenery in parks and along streets makes Berkeley a more beautiful city, and is critical to Downtown's livability and success as a place. Trees and other landscaping on City land and in the public right-of-way enhance Downtown environmentally, economically, and culturally.

Healthy People & Ecosystems. People derive psychological benefits by having access to green spaces and feeling a connection with nature. Collective acts of planting trees and caring for landscapes build community. Where trees and landscaping are planted at curbside or in traffic islands, traffic speeds are lower and rates of serious injury diminished.

Economic Development. Trees and landscaping increase property values and can reduce maintenance costs of other streetscape elements. They also promote an attractive sense of place and will help Downtown Berkeley compete as a regional destination.

Beauty and Identity. Street trees and landscaping play a critical role in making downtown's more attractive and inviting. They are also a source of civic pride. Unfortunately, one-quarter of all street frontages in Downtown have no street trees as indicated in Figure h.3, Street Segments without Significant Street Trees. In response, tree planting deserves emphasis. Omnipresent trees and landscaping will help improve Downtown as a place to work, live and visit. If the character of new trees is considered in the context of existing trees and abutting uses, tree planting will also strengthen the attractiveness and highlight the identity of each Downtown street.

Facing Page: ***Street trees*** *offer many benefits, the most obvious of which may be shade and the sheltering effects of an outdoor canopy. Staff photo.*

Connecting with the UC Campus. Trees and landscaping may provide opportunities to bring a sense of UC Berkeley's extraordinary campus into the Downtown -- a campus that is known for its glades, plazas, and natural areas.

POLICIES AND ACTIONS

Policy 5.1, Planting Program & Priorities. Promote the installation of Downtown street trees to the extent possible, with the ambitious but attainable goal of 1000 Trees by 2020. Strive to create a continuous canopy of trees along every street over the long term.

a. Where adequate space exists, gaps in the spacing of street trees should be filled and a continuous canopy of trees should be created along every street. Major gaps in the street tree canopy are depicted in Figure h.3, Street Segments without Significant Street Trees.

b. The City should strive to plant 500 trees in the Downtown Area by 2020 (about fifty per year), using existing City programs, with a near-term target of 100 trees planted per year until new financial resources are established (see also Financing Plan & Near-Term Priorities) . An additional 500 trees should be planted as part of major public improvements, as in kind contributions from private development, or through initiatives sponsored by the Downtown

Figure h.1. Trees & Placemaking. *Trees bring beauty and architectural form to urban places. They will play an important role in making Downtown more pedestrian-friendly and strengthening it as a destination, as has happened in downtown Vancouver, BC (above) and downtown San Jose (below).*

Figure h.2. Cadence. *The rhythm of trees and lighting can provide a sense of place that is distinct and memorable.*

Berkeley Association or other organizations.

Policy 5.2, Tree Palette & Community Character. New trees should be selected in the context of community character and environmental objectives, along with existing conditions such as existing tree species on each street. Street trees make an enormous positive contribution to the character and quality of urban places, especially when they are selected to promote visual congruity, livability and maximize aesthetic benefits.

a. Limit trees to those that are appropriate to the Downtown as described in Appendix A, Palette of Appropriate Downtown Street Trees, except where indigenous or other drought resistant alternative would be equivalent. Explore whether indigenous or other drought-resistant alternatives may be available. The Parks/Urban Forestry Division should determine the species for new trees, in consultation with abutting property owners. Recommendations for specific streets appear in Tables h.1 and h.2, Recommended Trees by Street Segment -- except for trees selected in conjunction with Major Projects. Tree species have been recommended based on their form, size at maturity, color, texture, seasonal blossoms, and persistence of leaves (evergreen vs. deciduous). Staff may make revisions to these recommendations to address technical concerns, such as tree litter and maintenance costs.

b. A consistent rhythm and canopy of street trees is desirable -- especially on the most visible streets -- to provide a unified character and facilitate place recognition. Exceptions should be allowed to highlight major designated landmarked structures.

Policy 5.3, Tree Location. Use trees to shade and provide a canopy over sidewalks, and over bicycle and vehicle lanes to the extent possible, and to provide a sense of separation between pedestrians and vehicles. New trees should be positioned for public safety and a healthy urban forest.

a. While the location of new trees will be determined as part of major projects, new street trees are possible throughout Downtown. Street trees should generally be planted between the curb and the main path of pedestrian travel. In some instances, it is not possible to plant trees between existing curbs and the main pedestrian path – such as when sidewalks are relatively narrow or where constrained by utilities. In such instances, consider extending the curb so that trees can be planted but minimize the loss of on-street parking, such as by extending curbs next to “red zones.” Design projects to permit the parking and use of tree maintenance vehicles adjacent to the trees without interrupting traffic or requiring a street closure or detour.

b. Where typical street tree locations and curb extensions are not possible, consideration should be given to the use of tree wells in the parking lane. If deemed appropriate, trees that are planted in parking lanes should be adequately protected and address engineering and other critical concerns.

c. Street tree spacing should promote the creation of a continuous tree canopy. Doing so depends on the expected mature

Figure h.3. Street Segments without Significant Street Trees. *Trees should be planted throughout the Downtown Area, not only as part of "Major Projects" but also along street segments where street trees are missing – as are indicated here.*

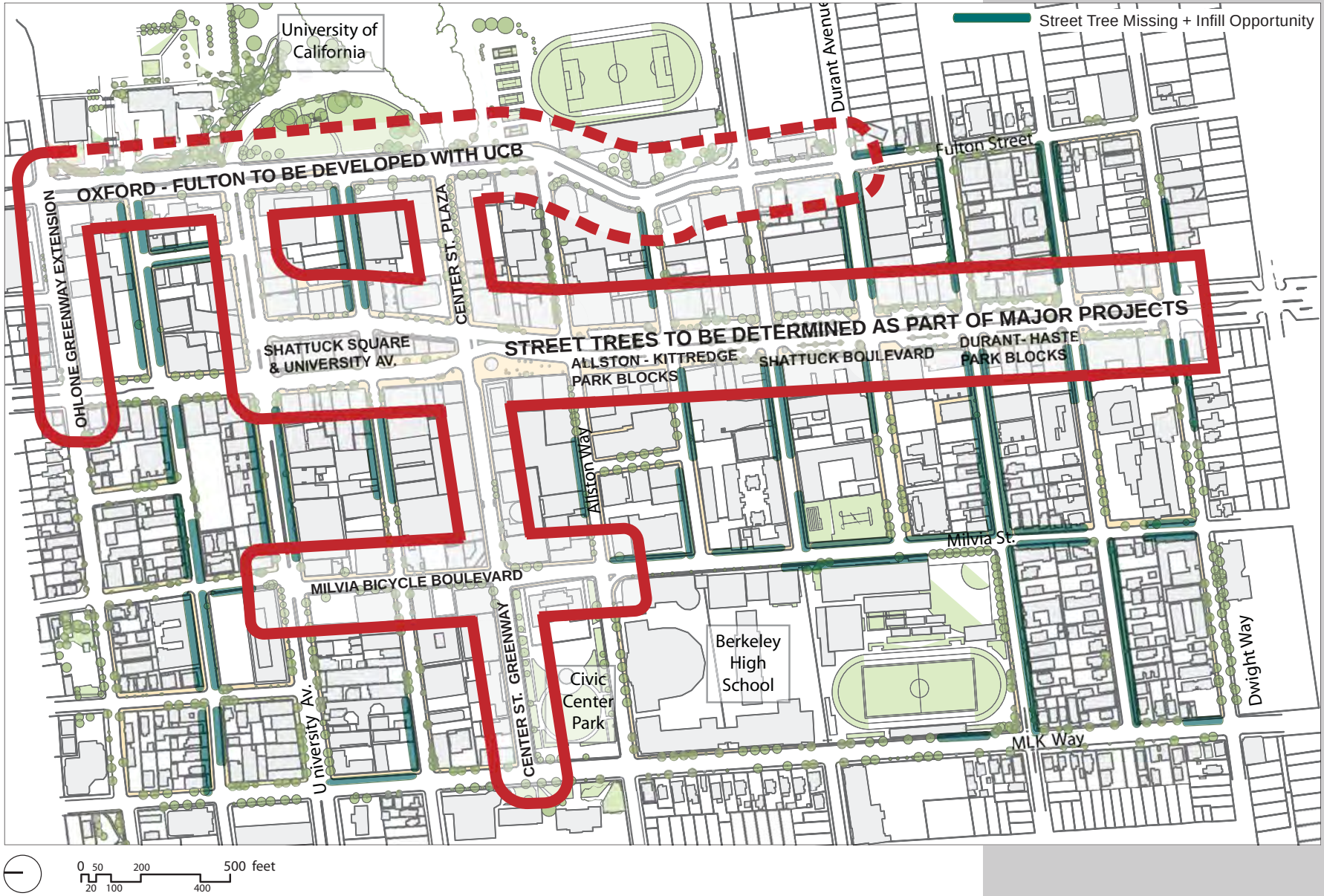


Figure h.4. Tree Guards & Grates. *In areas of heavy use, tree guards and tree grates offer important protection.*

size of the tree. Generally, space new trees so they can reach a mature canopy without crossing branches with any adjacent tree, so as to avoid competition and manage disease. Refer to the "Tree Palette" (appendix A) for spacing guidelines specific to each tree species.

d. Trees in medians, when appropriate, should follow the same spacing requirements as those on the sidewalks that run parallel.

e. While a full and continuous canopy of street trees is desirable, trees should not create unsafe conditions or put utilities at risk. Care should be taken to avoid conflicts between street trees and the use of passenger loading zones, parking for persons with disabilities, and/or bus stops, on a case-by-case basis. A minimum clearance should be provided between street trees and the following elements:

Intersection:	20 feet
Stop sign/signal:	20 feet
Streetlight:	half of width of mature canopy for species selected
Utility box:	5 feet
Utility pole:	10 feet
Water meter:	5 feet
Gas line:	5 feet
Sewer:	5 feet
Fire hydrant:	5 feet
Parking Meter:	5 feet
Driveway:	5 feet (commercial driveways may need greater distance)
Building drain line:	5 feet
Storm drain:	5 feet

Policy 5.4, Preparation & Installation. Trees and associated features should be installed in ways that promote the sustained health of the trees.

a. In the Downtown Area, responsibility for planting and maintaining trees falls into two categories: for residential frontages and for commercial/cultural/civic frontages. In all cases, trees growing in City rights-of-way are property of the City of Berkeley.

b. "Figure h.3, Street Segments without Significant Street Trees" identifies significant gaps in the street tree canopy, and should be referred to when setting priorities and planning tree planting events.

c. Installation should follow Parks/Urban Forestry Division standards and guidelines. For residential frontages, planting and maintenance should be provided for using citywide programs and procedures, which are described in Berkeley's "Illustrated Guide to the Street Tree Planting Program" (available at the reference desk of each branch of the Berkeley Public Library). Where appropriate, trees would be planted in public right of way locations at the properties of residents who request them, to the extent that funding permits. Under this citywide program, abutting residents, agree to follow City procedures including watering the tree for at least three years; keeping the tree well clear of weeds and filled with soil or mulch; and to clean-up all leaf debris.

d. For commercial, cultural, and civic frontages, the Parks/Urban Forestry Division should coordinate planting and maintenance. (Costs of installation, establishment, and maintenance are addressed

under “Financing Plan & Near-Term Priorities”). To accelerate tree planting, a property owner along these frontages may choose to sponsor a tree or trees using citywide programs.

e. Tree basins (the hole that they are planted in) may have various shapes but should be at least 16 square feet to maintain adequate oxygen and water, and should ideally be 32 square feet. Continuous trenching between tree basins should be used wherever possible, particularly where minimum sized tree basins must be employed.

f. Permeable materials should be used to maximize tree root access to water and oxygen. When the optimal tree basin size is not possible, engineered soils or other treatments should be used to promote root growth and health.

g. Soil amendments are not typically recommended. Occasionally a poor soil may warrant soil amendments consisting of organic matter that has a low-bulk density, such as compost, fly ash, peat, leaf mold, or composted sewage sludge. Where street trees are placed in locations that were previously the street or parking spaces, such as in bulb-outs, soil amelioration will be required to provide sufficient aeration and nutrients.

h. Street trees can be positioned and installed in ways that capture stormwater and filter pollutants in urban run-off (see also “Watershed Management & Green Infrastructure”).

i. The surface of tree basins should be brought to the same level as surrounding grade, by topping the tree basin with decomposed granite (DG), by covering the basin with sand-set paving stones, or with a metal grate.

j. Tree grates should be used where high levels of pedestrian activity are anticipated, such as places with frequent entrances for commercial, cultural or community uses. Tree wells and accompanying grates should be at least 16 square feet to provide adequate entry of water and oxygen into the soil.

k. Below grates, tree basins should have a top surface just below the grate to reduce litter that can fall in and become trapped. In addition, grates should have removable inner rings to allow for tree trunk growth. Forestry Section product and installation specifications are available and should be used.)

l. Tree guard installation is recommended in conjunction with tree grate installation. Other protective devices may be used where vandalism has been problematic, and if equipment (for construction or other purposes) may be used in close proximity. In all other locations, it is preferable to protect the tree and promote vertical growth by installing stakes on street side of each new tree.

m. Tree grates are not necessary where lower levels of pedestrian traffic are anticipated. In residential areas, street trees should be planted within continuous landscape strips with appropriate shrubs and groundcover. In some residential locations, preexisting concrete or utilities may make the use of a tree well a better option; in these locations tree grates should not be used and tree

Figure h.5. Neighborhood Involvement. *Trees can be planted as part of community-building events that encourage ongoing care for an urban forest.*

wells should be filled with decomposed granite (or similar material).

n. Low-activity locations with commercial, cultural or community uses should be evaluated to determine whether there is a relatively high turnover in on-street parking. Where there is not a high turn-over rate, a continuous planting strip is preferred. When sidewalks come to the curb near low-activity commercial, cultural or community areas, tree wells should be used but may be filled with materials approved by the City instead of using a tree grate.

o. Minimum tree size at planting is a 15-gallon container, and 24-inch box is required when associated with development. The caliper (trunk diameter) of trees to be planted should be a minimum of 3/4 to 1.5 inches for a 15-gallon container, and 1.5 to 2.5 inches for a boxed tree.

p. The City gives priority to planting trees where trees have been removed, but planting may not necessarily occur in the same spot on account of underground utilities, intersection visibility, and other concerns

Policy 5.5, Establishment & Maintenance. Trees should be maintained to protect public safety and the health of the tree.

a. Tree grates should be maintained regularly to insure clearance around tree trunks and to eliminate tripping hazards.

b. The top surface of tree basins should be maintained to be the same level as surrounding grade, unless it is being used for stormwater treatments. This grade may be maintained by topping the tree basin with decomposed granite (DG), by covering the basin with sand-set paving stones, or with a metal grate.

c. If the tree basin is to be used to retain water, suitable tree species should be selected and the top surface should be the level of adjacent gutter. Where the top of a basin is intentionally lower than surrounding grade, it should surrounded by a curb or other barrier to prevent tripping.

d. For higher street-tree survival rates, a responsible party – such as an abutting property owner, community organization, or landscape contractor -- should weed, water and mulch a new tree for the first three years after planting. Newly planted trees must be given approximately 20 gallons of water once a week, especially during warm weather seasons (approximately from March 15 to October 15). The responsible party should also keep grass and weeds out of mulching areas, without damaging the base of the tree.

e. Pruning must be coordinated and authorized by the Forestry Section, and should be conducted under the supervision of a Certified Arborist. No branches should extend beyond the tree basin perimeter below 8 feet in height. Tree branches that extend over pedestrian paths of travel should be maintained to provide 8 feet of vertical clearance. Over vehicle lanes, branches should pruned to provide a 14-foot minimum clearance.

f. Where sidewalk damage presents insufficient path of travel (a minimum of 6 feet) or a tripping hazard, the sidewalk should be repaired.

g. Tree litter or “leaf drop” affects maintenance costs associated with raking and sweeping, but also impacts the City’s ability to conform with stormwater quality standards. If needed, design recommendations and management practices should be refined to address this issue.

Policy 5.6, Tree Removal. It is the policy of the City to protect all public trees from unnecessary removal and make every effort to preserve and protect public trees until such time as removal is warranted and prudent.

a. Trees should only be removed when a tree is dead, severely diseased or declining, structurally unsound, hazardous, or does not meet criteria established by City urban forestry staff. City of Berkeley tree removal criteria can be viewed on-line.

Policy 5.7. Ground Cover & Shrubs. Drought tolerant groundcovers and shrubs are encouraged in landscaped areas, except for tree basins, and should provide for public safety.

a. Generally, mature shrubs should not exceed 36 inches. For major project opportunities, the palette of shrubs and ground cover should be determined in the context of the overall design.

b. A responsible party, such as an abutting property owner, community organization, or landscape contractor, should be designated to weed, watering and mulching drought-tolerant vegetation for the first year after planting. Responsibilities should be set forth in a signed agreement, and monitored by Forestry staff. Irrigation should be provided where drought-tolerant plants are not used or where hand-watering cannot be assured.

c. Landscaping should provide should not interfere with parking for persons with disabilities, and should provide adequate access to utility boxes.

d. Raised planter beds and potted plants may be incorporated into sidewalk areas (see Furnishings and Other Amenities).

e. “Living walls” might be used to mitigate the negative visual impact of blank walls, by growing vines on a lattice, grid of wire or armature. Where living walls are within public spaces, care should be taken to assure adequate sight lines for assuring that spaces are perceived as safe and inviting.

Figure h.6. Living Walls. *Living walls may provide a metal armature around which plants can grow. Living walls offer a way to add greenery in a conspicuous way.*

TABLE H.1. RECOMMENDED TREES BY STREET SEGMENT FOR DOWNTOWN AREA: EAST-WEST STREETS

BERKELEY WAY			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Oxford to Shattuck	Abuts UC Development	Chinese Pistache	Pistache
Shattuck to Milvia	Residential	Plum & Black Acacia	Purple Leaf Plum
Milvia to Bonita	Residential	Plum	Purple Leaf Plum
Bonita to MLK	Residential	Evergreen Pear & Magnolia	Decid. Pear or Evergreen Magnolia

UNIVERSITY BELOW SHATTUCK			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Oxford to Shattuck	Part of Major Improvements	Red Maple	no infill needed
Shattuck to Milvia	Commercial	Tulip Poplar & Red Maple	Red Maple or Frontier Elm
Mivia to MLK	Commercial	Tulip Poplar	Red Maple or Frontier Elm

ADDISON STREET			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Oxford to Shattuck	Commercial & Cultural	Tristania Elegant & Sourgum	Sourgum or Tristania Laurel Box
Shattuck to Milvia	Commercial & Cultural	Hornbeam	Hornbeam, Sourgum or Frontier Elm
Milvia to MLK	Commercial	London Plane & Sweetgum	Columnar Red Maple

ALLSTON WAY			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Oxford to Shattuck	Commercial & Cultural	L. Plane, Pittosporum & Ev. Magnolia	London Plane
Shattuck to Harold	Commercial	Hackberry	Chinese Pistiche
Harold to Milvia	Commercial & Cultural	Chinese Pistache	Chinese Pistiche
Milvia to MLK	Park & Civic Uses	London Plane & Camphor	London Plane or Chinese Pistache

KITTREDGE Street			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Oxford to Shattuck	Commercial & Cultural	Australian Willow & Sweetgum	Columnar Red Maple
Shattuck to Harold	Commercial & Cultural	Chinese Elm & Katsura	Frontier Elm or Columnar Red Maple
Harold to Milvia	Commercial & Residential	Frontier Elm	Frontier Elm or Columnar Red Maple

Tables h.1 & h.2 (Recommended Street Trees) *only pertain to Street segments that are not within Major Projects. For Major Projects, a consistent and appropriate palette of trees should be defined during design development.*

BANCROFT WAY			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Fulton to Shattuck	Commercial	Live Oak & Holly Oak	Live Oak, Colum. Oak or Tristan. Elegant
Shattuck to Milvia	Commercial & Residential	Red Maple	Columnar Red Maple

DURANT AVENUE			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Fulton to Shattuck	Commercial	Chinese Flame & Ash	Chinese Flame or Zelkova
Shattuck to Milvia	Commercial & Residential	Elm, Hackberry & London Plane	London Plane (no.); Fr. Elm or Zelkovia (so.)

CHANNING WAY			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Fulton to Shattuck	Residential	Red Maple & Sourgum	Sourgum
Shattuck to Milvia	Residential	Maple & Hackberry	Sourgum
Mivia to MLK	Residential	Linden, Sourgum & Ash	Sourgum

HASTE STREET			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Fulton to Shattuck	Residential	Citrus, Ash & Sourgum	Red Maple
Shattuck to Milvia	Residential & Hospital	Sweetgum	Red Maple or Hedge Maple
Mivia to MLK	Residential	Sweetgum	Red Maple or Hedge Maple

DWIGHT WAY			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Fulton to Shattuck	Commercial & Residential	Evg. Pear, Fern Pine, Willow & Sumac	Red Maple
Shattuck to Milvia	Hospital & Small Office	Sweetgum	Red Maple
Mivia to MLK	Residential & Parking Lot	Sweetgum	Red Maple

TABLE H.2. RECOMMENDED TREES BY STREET SEGMENT FOR DOWNTOWN AREA: NORTH-SOUTH STREETS

OXFORD-FULTON			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Hearst to Durant	Part of Major Improvements	Holly Oak & Frontier Elm	determined as part of Major Project
Durant to Channing	Residential	Linden & Chinese Flame	Chinese Flame or Deciduous Oak
Channing to Haste	Residential	Holly Oak & Linden	Chinese Flame or Red Oak
Haste to Dwight	Residential	Live Oak & Miscellaneous	Live Oak or Chinese Flame or Red Oak

WALNUT STREET			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Berk. Way to University	Commercial & Residential	one lone Alder	Decid. Pear, Live Oak or Bl. Walnut

MILVIA STREET			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Hearst to University	Residential & Commercial	Decid. Pear & Evg. Magnolia	Decid. Pear or Evg. Magnolia
University to Allston	Part of Major Improvements	London Plane & Sweetgum	London Plane or Columnar Red Maple
Allston to Bancroft	Civic	Ginko & Decid. Pear	Ginko
Bancroft to Channing	Residential & Civic	none present	London Plane or Ginko
Channing to Haste	Residential	none present	Hedge Maple (east); Red Maple (west)
Haste to Dwight	Residential & Hospital	Sweetgum	Japan. or Hedge Maple (e.); Red Maple (w.)

BONITA AVENUE			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Hearst to Berkeley Way	Commercial & Residential	Palms, Hawthorn & Sumac	Purple Leaf Plum
Berk. Way to University	Commercial & Residential	Plum	Plum or Hawthorn

MLK Jr. WAY			
Segment	**Context**	**Existing Tree Species**	**Proposed**
Hearst to University	Commercial & Residential	Raywood Ash	Red Maple or Raywood Ash
University to Allston	Civic & Commercial	London Plane, Maple, Sweetgum	Red Maple
Allston to Dwight	School & Residential	Sweetgum, Elm & Camphor	Red Maple or Honey Locust

FURNISHINGS & OTHER AMENITIES

FURNISHINGS & OTHER STREET ELEMENTS

PRINCIPAL CONSIDERATIONS

Furnishings and other pedestrian amenities make places more inviting and comfortable. Street elements like benches, seat walls and newsracks support a wider range of activities than would otherwise occur. This is also true of less common elements, such as kiosks – small free-standing structures that have flower stands, magazine stands, information services, and other micro-services and businesses.

Street elements help create attractive settings. When furnishings, lighting, signage and other elements have a consistent look, they also help promote a distinct and memorable sense-of-place.

By increasing activity in public places, street elements enhance public safety, and can be designed to discourage inappropriate behavior. Public welfare is also enhanced by providing trash receptacles and restrooms, and by maintaining clean environments.

When combined, well-designed and appropriate elements will also promote Downtown as a social and economic center, by allowing people to rest or read, enjoy carryout, socialize, or simply watch passersby.

Facing Page: *When designed for pedestrians, streets provide important public space where community life can occur, as is the case along Santa Barbara's State Street. Staff photo.*

POLICIES AND ACTIONS

Policy 6.1, Prioritizing Active Places. Prioritize street elements in locations where high levels of pedestrian activity occur, while maintaining adequate pedestrian flow and access.

a. Prioritize the following locations for new and renovated seating and amenities: Shattuck Avenue, Center Street, Allston Way and University Avenue, and other locations where pedestrians tend to converge, such as near intersections and in front of major destinations. Curb extensions, plazas, and other larger spaces are ideal opportunities for seating and amenities.

b. Street trees and street lighting should define a principal rhythm within which street elements may be placed. The location of amenities should be secondary to the requirements and rhythm of street lights and street trees..

c. Street elements are best situated either immediately adjacent to buildings or in the curbside "amenity zone" alongside street lighting and street trees.

d. A clear path of travel shall be maintained on all streets. Furnishings and other elements should not conflict with wheelchair access, swinging car doors, transit stops, or access to fire hydrants. Frontages with commercial and cultural destinations should be complemented with a path of travel that is at least six feet clear. All streets shall comply with Berkeley's Municipal Code, Federal guidelines, and Department of Public Works procedures.

Figure i.1. Seating. *Downtown offers seating that is well used but generally inconsistent with the traditional look of other public improvements (top). Benches, seat walls, and other amenities offer opportunities to create a distinctive sense of place, as has happened in downtown Santa Barbara (below).*

Figure i.2. Outdoor Dining. *Outdoor dining can happen in line with street trees, or can be located adjacent to building fronts.*

Policy 6.2, Seating. Seating and other features should be designed for the public's enjoyment and safety. Seating and other street elements should be used to call attention to scenic, artistic, and historic features.

a. At major social nodes, integrate seating with other street elements, such as planter/seat walls and benches around trees or kiosks. Public art should also be used as an opportunity to offer amenities (see "Public Art").

b. Seating should generally face the main flow of pedestrian traffic, or be perpendicular to it. Significant exceptions are at bus stops where benches and transit shelters will face the curb. "L"-shaped seating should be used occasionally to create social spaces for a few people.

c. Seating should be clearly visible from streets and well lighted. Where seating is used occasionally, it should be designed to discourage lying down.

d. Where sidewalks are immediately adjacent to traffic lanes with vehicles speeds exceeding 20 miles per hour, consider using attractive metal fencing to protect pedestrians and discourage jaywalking.

e. If possible, locate seating under trees and awnings.

f. The orientation of seating may be varied to direct views toward the Bay, the Hills, public art, and architecture of merit.

g. Integrate opportunities for persons who use wheelchairs in all public seating.

Policy 6.3, Visual Consistency. The aesthetic character of street elements should establish a consistent appearance and reinforce Downtown's historic character, with exceptions made where appropriate.

a. Street elements should have a traditional appearance, consistent with the early 20th-century look of many existing light poles. Metal elements are preferred over wood, and they should have a highly-durable low-luster forest-green enamel finish.

b. Exceptions may be made to accommodate public art and features that promote environmental sustainability.

c. Exceptions may also be made to help specific streets and plazas stand out, but exceptions should generally not be made where historic resources are concentrated: on Shattuck between Berkeley Way and Durant Street, and on University Avenue east of Shattuck.

d. Avoid obstructions that unnecessarily obscure buildings, such as mesh on bus shelters.

Policy 6.4, Commercial Synergies. Restaurants should be encouraged to provide outdoor seating, where it can be accommodated -- and in ways that enhance the experience of the general public. Kiosks for food, flowers, magazines, crafts, and other small business activities are encouraged within Downtown parks, plazas and sidewalks, where they can be accommodated and if their on-going attractiveness is provided for.

a. Review existing City policies and procedures that may pose barriers to outdoor dining on public property, and consider other private uses that might enhance Downtown streets and open space. Eliminate barriers to the extent possible, while also assuring that concessionaires pay their fair share of public maintenance costs.

b. Encourage use of attractive metal fencing and terracotta planters to "corral" dining areas and enliven sidewalks. Wood and plastic boxes are generally discouraged unless especially durable and attractive.

c. Allow food kiosks that are associated with Downtown restaurants. Encourage permanent (non-movable) kiosks where described under Major Projects, and give Downtown restaurants priority when selecting concessionaires.

d. Develop standards and/or guidelines for kiosks so that they are made with durable graffiti-resistant materials, are aesthetically appropriate, and assure public health and hygiene.

Policy 6.5. Service Kiosks. Information kiosks and restroom kiosks should be installed at common arrival points in Downtown and to serve Downtown residents. Kiosks should not present a nuisance to nearby uses

a. Locate a bathroom kiosk near BART and consider bathroom kiosks in other high-activity locations. Restroom kiosks should be located away from eating establishments and locations where outdoor dining exists or is anticipated.

Figure i.3. Kiosks. *Information, restrooms, and amenities can be provided within public open spaces, through the use of small kiosks.*

b. Establish visitor information kiosks as described under Signage & Wayfinding.

c. Install kiosks with "community bulletin boards" for use by residents of Downtown and surrounding neighborhoods.

Policy 6.6, Newsracks. Newsracks should be attractive, well used, and well maintained.

a. Movable newsracks should be discouraged to the extent possible. Encourage the use of permanent newsracks.

b. The City should replace "permanent" newsracks, and reduce the number of permanent newsracks so as not to exceed demand.

c. Consider public-private arrangements in which a contractor would provide on-going management and maintenance, in exchange for advertising revenues.

d. Newsracks should be consistent with the color and character of other street elements (see Visual Consistency).

Policy 6.7, Cleaning & Maintenance. Encourage a clean Downtown, with street elements that are attractive and well-maintained. Improvements and programs should maintain cleanliness, avoid clutter, and encourage recycling."

a. Provide frequent trash receptacles, especially in locations prone to littering such as near transit stops and fast-food restaurants. Where littering is clearly attributable one or more businesses, they should pay for and maintain nearby trash receptacles. Receptacles should have a capacity of at least 30 gallons.

b. Public trash receptacles should be consistent with the color and character of other common street elements (see Visual Consistency). They should be designed for easy garbage pick-up and maintenance.

c. Public trash receptacles should be durable and made of metal, and they should be consistent with the color and character of other street elements.

d. Public restrooms should be maintained to high standards through the allocation of adequate City resources and through public-private cooperation.

e. Consider ways to expand the capacity for cleaning and landscape maintenance through better coordination, greater efficiency and increased funding (see Operations & Maintenance chapter).

f. Work with merchants and property owners to limit negative impacts from collecting trash from businesses, such as minimizing time that trash cans may be placed near curbs. Review and, if needed, strengthen Zoning to encourage interior trash-can enclosures for every business in Downtown.

Figure i.4. Newsracks. *Assorted individual newsracks can be unsightly. Coordinated newsracks can be attractive but provisions should be made for their ongoing maintenance and management.*

PUBLIC ART

PUBLIC ART

PRINCIPAL CONSIDERATIONS

Importance and Potential. Public art can delight and engage those who encounter it, and should play a vital role in making Downtown a local and regional center for culture and community life. Art will help promote Downtown as a unique place and appealing destination, and stimulate economic development through cultural tourism.

Art has the potential of expressing the community's values and aspirations for the Downtown. It can draw attention to Downtown's history, its architecture, and its function as a center of commerce, education, and the arts. It can reinforce Berkeley's commitment to environmental sustainability in a variety of ways such as referring to the natural systems to which Downtown is connected, reusing cast off materials, or incorporating "green" features. Context-sensitive installations would also help harmonize and give consistency while still offering variety and providing artistic freedom.

Art, if mindfully conceived and positioned, can be used to accentuate public plazas, focal points, and other key locations. Locations that are or will become visually prominent are ideal locations for major and permanent installations. While several works of art are anticipated, the commissioning one major and singularly-exceptional work of art could embody aspirations for Downtown's rebirth.

Facing Page. Art & Placemaking. *Public art engages people and can play an important role in making Downtown a unique destination.*

Public art need not be limited to large sculptures but can also be incorporated into features found throughout the Downtown. Utility boxes, bike racks, benches, transit shelters, and banners are examples of more commonplace opportunities for functional art that add whimsy, provoking interest, and making Downtown Berkeley more special.

Temporary installations can make Downtown dynamic with an ever-evolving canvas. Temporary installations could convert a parking space into an outdoor room, or turn a blank wall into a light show. Temporary installations can also be the subject of special events, attractions, or festivals.

Temporary installations can explore ideas without demanding a long-term commitment. Such works can allow artists to experiment with challenging themes or media. Temporary art can provide an opportunity for fund raising when the art is sold.

Through an inclusive process, art can embody Berkeley's collaborative spirit. Merchants, theatres, museum, and historic preservationists are among the many Downtown stakeholders who could work with artists so that the resulting art will be broadly enjoyed and sensitive to its context. Community members can also participated directly to create large mosaic sculptures and murals.

Citywide Policy Context. In 1985, the City of Berkeley passed a Visual Art Ordinance that established the process for the selection of Public Art in the city. In 1991 an Ordinance was passed that gave the Civic Arts Commission the power to choose the artist and the site. In 1999 the "1.5% for Art" Resolution was passed that set the process for city funding for

Figure j.1. Major Works of Art. *Italo Scanga's permanent installation, "Figure Holding the Sun" located on the plaza of the San Jose Museum of Art (SJMA).*

Figure j.2. Temporary Art. *Charles Gadeken's "El Corazon" created for San Francisco's temporary "Hearts for the Arts" installation.*

Figure j.3. Functional Art. *Musician David Byrne's functional art bicycle rack design "The Ladies' Mile."*

Figure j.4. Transit Canopies. *Transit cover on San Francisco MUNI aboveground station features functional art.*

Figure j.5. Banners. *Banner in San Francisco's Lower Haight District.*

public art only on City property. This public art money comes as a portion of the capital construction budget for public improvements and must be written into public bond measures that pertain. 1.5% for Art money can only be spent on permanent installations (fine art or functional art) and cannot be spent on temporary installations.

In 2001 the "Guidelines for Public Art" process was published that clarifies specifics on carrying out all the above. A complete "Guide to the Public Art Process in Berkeley" publication can be seen on line at: *http://www.ci.berkeley.ca.us/uploadedFiles/City_Manager/Level_3_-Civic_Arts/Public%20Art%20Process%20Guide.pdf.*

The Downtown Measure S projects were the first phase of the Public Art Program. These projects were funded by a voter bond issue passed for Downtown improvements. These projects include the sidewalk poetry walk and artworks on Addison Street, the hand carved Library Gates in the Central Public Library, and the two large downtown sculptures.

At the time of this writing, the Civic Arts Commission has formed a committee to look into the establishment of a Private Percent for Art program that would require private developers to contribute 1.5% of their capital budget for public art. Private Percent for Art would follow the same practices as the 1.5% for Art program that applies to public improvements (as outlined above).

The Civic Arts Commission and staff have researched new directions in public art from the City of Santa Monica, the County of Los Angeles, and other jurisdictions that use funding from private developers to fund permanent and temporary installations, including produc-

Figure j.6. Addison Street Arts District. *Addison Street Art and Poetry Walk.*

Figure j.7. Sidewalk Poetry. *Sidewalk inlay by local poetry artist featured on Addison Street Art and Poetry Walk.*

tions by film and video and arts nonprofits. Consideration for similar funding opportunities is included below.

POLICIES AND ACTIONS

Policy 7.1. Aspirations & Opportunities. Use art to embody Berkeley's aspirations for a vibrant Downtown. Take advantage of abundant opportunities for public art throughout Downtown.

a. Continue to promote major permanent installations through Berkeley's "1.5% for Art" program, which dedicates one percent of budget of capital projects to develop and install permanent art, and an additional half percent to cover associated administrative costs. Seek additional funding of public art from major businesses and institutions, and developers active in Downtown.

b. As a near-term priority, install one major and aspirational work of art at a prominent location Downtown. Develop a process and funding to commission a world-reknowned artist. Use this process as a way to bring stakeholders together and bring attention to Downtown art and revitalization.

c. Promote functional art, such as street furnishings, bicycle racks, kiosks, manhole covers, and newsracks. Give special consideration to "play art" to engage children and bring more families Downtown. Explore opportunities for incorporating public art within BART and AC Transit improvements. Develop concepts for functional art in cooperation with interested agencies and the Civic Arts Commission.

d. Take advantage of commonplace or "ubiquitous" opportunities for art, such as utility boxes and banners, especially for providing art in the near-term. Seek sponsorship by nearby merchants and cultural stakeholders, who might play a special role in their design.

e. Consider ways to encourage temporary installations including but not limited to: freestanding pieces, temporary furnishings, sidewalk renderings, and light shows. Consider ways to associate temporary installations with special and seasonal events. Look into how funding would occur, since temporary installations cannot be funded using existing programs.

f. Encourage the participation of Downtown's cultural and educational stakeholders, such as Berkeley City College's media programs, the Berkeley Art Museum and

Figure j.8. Parklets. *Temporary "parklet " furnishing designed by Rebar Group along San Francisco's 22nd Street.*

Figure j.9. Community Building. *In San Francisco's 24th Street Mini Park, the mosaic dragon, "Quetzalcoatl," was implemented by community members under the direction of an artist.*

Figure j.10. Pedestrian Barriers. *Art can keep pedestrians from jaywalking.*

Figures j.11 (above) & j.12 (at right). Art from Recycled Materials. *Dan Das Mann and Karen Cusolito's temporary sculpture, "Ecstasy" in San Francisco's "Patricia's Green". This work of art can be enjoyed at a distance but also up close, where individual pieces of recycled metal can be appreciated.*

Pacific Film Archive, and Downtown's live theaters and cinemas.

g. Where railings or planter boxes will be used within street rights-of-ways, encourage restaurateurs and merchants to use appropriate and artful motifs

h. Consider ways for Berkeleyans to participate directly in creating art, such as Venice California's "graffiti wall" and San Francisco 24th Street's mosaic dragon.

Policy 7.2, Placement. Art should be a pedestrian amenity and engage visitors to Downtown.

a. Recognize locations with visual prominence and give them special consideration for major and permanent installations.

Prominent locations include public plazas, "vistas" and other focal points along frequently traveled paths (see Figure j.16).

b. Public art should be accessible to people on foot and in wheelchairs. Avoid locations that are not along pedestrian routes, such as in medians.

c. Design development for street & open space projects should define suitable locations for art and explore ways to create synergies between art and programmatic elements. The Civic Arts Commission should be consulted as part of this design development process.

d. District-wide installations should be considered. Take advantage of the way people typically move through Downtown through the coordinated and rhythmic use of banners or other expressions.

e. Public art should be considered as a way to help visitors navigate Downtown. (See also "Signage & Wayfinding") Linear installations can mark paths to points of interest, and might include distinctive light features, or sidewalks imprinted or with metal inlays.

f. Public art should not conflict with wheelchair access, swinging car doors, transit stops, or access to fire hydrants. Barricades may be required for detection by persons with visual impairments.

g. The Department of Public Works shall be consulted as the location of art is decided, so that Department concerns are addressed, such as its proximity to utilities and sight lines for traffic.

Policy 7.3, Context-Sensitive Art. Public art should be appropriate to Downtown. While varied and creative expressions are encouraged, permanent art installations should support surrounding uses, reinforce Downtown themes (described below), complement subdistricts of special character, and harmonize with Downtown's visual character. Temporary installations need not give context-sensitive considerations as much emphasis, so that it can be more experimental.

a. All art should be reviewed, selected and installed consistent with the Ordinance on "Visual Art in Public Places." In the Downtown Area, selection panels (or one selection panel) should be comprised of three consultants (as required) but also at least one representative of: the Civic Arts Commission, Design Review Committee, Landmarks Preservation Commission, and Downtown Berkeley Association.

b. Merchants and cultural stakeholders in the vicinity of the proposed installation should be consulted during the review process and before the panel makes its final recommendation to the Civic Arts Commission.

c. Encourage compatibility within Downtown's unique setting by spelling out the following provisions in Berkeley's "Guidelines for Public Art."

- Projects should relate to a site's "existing or future architectural features, … historic geographical and social/cultural context, …[and] surrounding neighborhood."

- Proposals should be evaluated as the "potential impact of the public art project on residents, [and] businesses," and projects should be modified to reduce these impacts.

d. Establish guidelines for commonplace/ubiquitous opportunities, to encourage visual consistency with Downtown and each other -- but still provide ample opportunities for creative expression. For example, art on utility boxes might always be accompanied by a similar border or "frame." Exercise discretion when considering ubiquitous and functional art so that it is not tacky or cliché.

e. Artists should be encouraged to consider principle Downtown themes, which represent broadly-held community values.

- History. Consider making references to Downtown's history to promote awareness and enrich the experience of walking through Downtown. Make the "Downtown Survey & Contexts" (Architectural Resources Group, 2007) avail-

Figure j.13. Downtown Choreography. *Seattle's "Broadway Steps" (by Jack Mackie) engages passersby.*

Figure j.14. Downtown as Destination. *Art can play an important role in strengthening places as a destination.*

Figure j.15. Transit Infrastructure. *Transit canopies and platforms present opportunities for art. In Barcelona, subway entrances are distinctly designed.*

able to selection committee members and potential artists. Avoid art that distracts from historic buildings in subdistricts where they are concentrated.

- Environmental Sustainability. Consider ways to make reference to the city's commitment to environmental sustainability, such as by making reference to Downtown's watershed or Mediterranean climate. Green technologies might be incorporated. Consider ways to reuse materials.

- Education. Consider ways to acknowledge Berkeley as a city of learning with a world-class university, award-winning high school, dynamic community college, cherished library, and thriving jazz school. Cutting-edge innovations, especially media-related innovations, could be added to Downtown's art portfolio.

- Transportation. Downtown developed as the convergence point for trains and other modes. This remains the case. Art could reference this in installations near BART.

- Diversity and Collaboration. Berkeley's racial, ethnic, and political diversity – and its tradition of inclusive democratic decision-making -- could find expression in the art but also in the process by which it is created.

f. Consider sidewalk inlays or other installations that highlight Berkeley's visionary personalities, such as Mario Savio, Allen Ginsberg, and others.

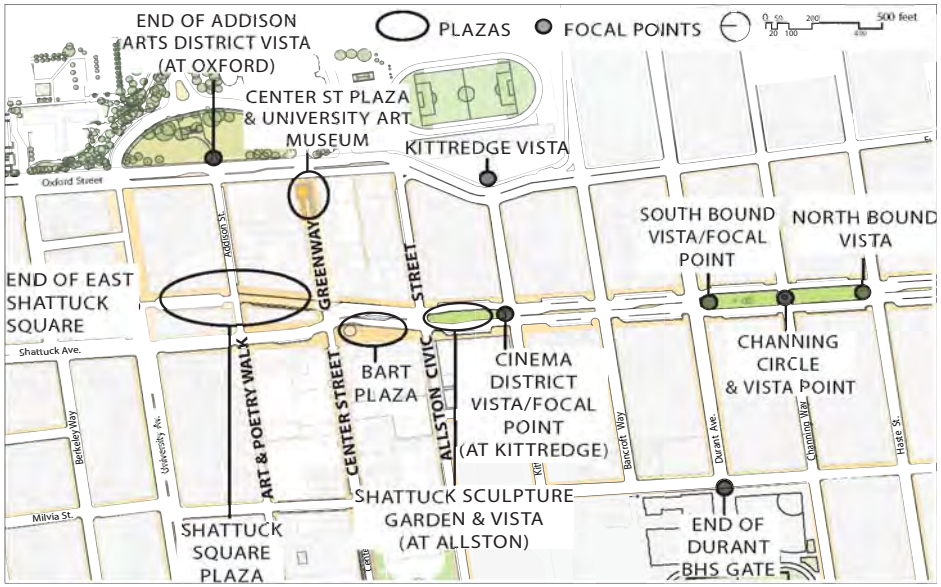


Figure j.16. Major Permanent Art Opportunities. *Downtown's street pattern creates focused views that will make public art especially prominent in some locations. Public art can be also integrated as an important component in Major Projects.*

g. Consider strategies so that art work may be moved or removed when Downtown improvements are made.

Policy 7.4, Maintenance & Repair. Provide for the ongoing maintenance and repair of art within an urban setting.

a. Project proposals should encourage art work that is structurally sound, durable, and is resistant to theft, graffiti, and other forms of vandalism.

b. The City should communicate clearly regulations and rights over art in the Downtown, such as through agreements and announcements.

c. The Department of Public Works shall be consulted where proposed projects are associated with utilities, such with the use of utility boxes, so that Department concerns can be addressed. The City shall not be liable for art that is damaged when taking care of safety emergencies.

d. Maintenance and repair costs should be factored into the SOSIP Financing Program (see "Financing Plan"). Seek to augment these costs through the direct participation of nearby merchants and stakeholders in monitoring condition and cleaning art projects.

e. Where appropriate, use methods that allow art to be replicated and replaced, such as through the use of digital archives.

f. The condition of Downtown art work should be surveyed at least every three years, so that needed repairs can be identified and prioritized.

Figure j.17. Fundraising & Art. *Cows on Parade.*

Figure j.18. Participatory Art. *Graffiti Wall, Venice Beach.*

PUBLIC ART CASE STUDIES

Chicago's "Cows on Parade" had artists apply art to over 300 fiberglass cows. While the "canvas" was consistent, artistic expressions were diverse as were their placement on sidewalks, in parks, and on top of buildings. Local businesses covered upfront costs. The program increased tourist spending by an estimated $100 million. Ultimately, the cows were sold with proceeds going to local charities.

Toronto used art to transform the character of ordinary – often unattractive – benches. Invited artists submitted proposals that followed criteria that emphasized durability and complemented each surrounding setting.

San Diego activated its waterfront promenade with "Urban Trees." Each sculptural piece has a canopy that gives scale and offers shade, while also adding color, form, and interest.

Los Angeles funded temporary art, art events, and youth education. For example, Venice Beach's "Graffiti Walls" allowed youth to express themselves in the public realm, and now serves as a major tourist attraction. Los Angeles also promoted art and bicycling with its "Bike Stops Here" program, which created original bicycle rack sculptures designed and built by local university students.

SIGNAGE & WAYFINDING

SIGNAGE & WAYFINDING

PRINCIPAL CONSIDERATIONS

Navigating Downtown. Many people who visit the Downtown may not be familiar with all that it has to offer. In spite of large numbers of signs, many destinations remain difficult to find. Necessary signage is either missing, poorly located, or difficult to understand. "Wayfinding" signage helps visitors – and anyone who is less familiar with Downtown -- find major destinations, parking garages, and places of interest. At a minimum, wayfinding signage should clearly communicate Downtown's street network and principle paths. To be most effective, wayfinding signage should be:

- legible – signs should be easy to understand;
- consistent – sign types should be limited and communicate information in simple ways,
- logical – sign placement and content should be meaningful and sequential.

Accumulated Complexity. Signage systems support multiple transportation, economic, social, and environmental goals. Through a process of "accumulated complexity," Downtown has acquired an enormous variety of sign types and numerous applications. Signs have a wide range of shapes, heights, and styles, which gives a sense of visual dissonance or "clutter." For example, there are four graphic conventions for bicyclists, and five for motorists. In addition, abutting signs are mounted on separate posts, and signs often hide other signs. As a consequence, signs often make navigating Downtown confusing rather than welcoming and accessible.

Facing Page: Wayfinding Signage at BART. *Wayfinding signs offer maps and directions on how to get somewhere – as is illustrated by a visitor-oriented sign in BART Plaza.*

User Groups. People arrive with different itineraries and needs, but can be thought of falling into a few simple categories. Wayfinding signage should serve:

a. visitors to Berkeley (retail & restaurant patrons, theatre & cinema goers, farmers market shoppers, tourists, business people, etc.);

b. visitors to UC Berkeley (event-goers, academics, parents, potential students, etc.);

c. students attending a range of institutions (UCB, BCC, and the many other significant institutions in Downtown);

d. Downtown's residents and workforce (all types); and

e. Berkeleyans who might like to become more familiar with Downtown (all Berkeley residents but especially parents, children, and seniors).

Placemaking. Signs can give deeper understanding and appreciation for Downtown, and can be used to reveal Downtown's heritage and Berkeley's commitment to sustainability and social equity.

International Icons. Signs can use simple icons (i.e. symbolic images) rather than words. Icons overcome language barriers and are used throughout the world, both of which make

Figure k.1. Clear Information. *A simple and legible palette of signs can help people navigate urban areas more easily. Color and icons can be used to communicate information without words.*

Figure k.2. Transit Information. *Route, schedule, and fare information promote transit use, and should be provided near BART and well-used bus stops.*

Figure k.3. Parking Facilities. *Some Downtown parking garages are underused. Signs should guide motorists and encourage the use of garages – and help make on-street parking more available.*

icons appropriate to Downtown. Icons also take up less space.

POLICIES AND ACTIONS

Policy 8.1, Finding Destinations & Points of Interest. Signs should make the essential geography of Downtown more obvious, by guiding pedestrians, bicyclists, motorists and transit users to major destinations, parking garages, points of interest, and transit nodes. In addition, signs should highlight community assets and values, such as Berkeley's history, educational institutions, and commitment to environmental sustainability. Signage should help people find special Downtown subdistricts, such as the Arts District, the cinema district, and the Civic Center district. Different sidewalk treatments can be used for people with vision impairments help find destinations and navigate Downtown.

a. Meet with Downtown stakeholders to identify simple ways to improve signage in the near term, such as by identifying the location of confusing or missing signage – especially as it relates to parking. Make such improvements, and continue to evaluate signage needs.

b. Work with Downtown stakeholders to identify destinations (like museums) and places of interest (like Strawberry Creek). Also work with UC Berkeley to make connections between "town and gown" more transparent, not only within Downtown but also on the UC Campus.

c. Downtown maps should appear more frequently, especially where pedestrians often have to make decisions on "how to get there," such as near transit stops, parking garages, and the bike station. Target these same decision-making locations for wayfinding signage. Signage should address all travel modes.

d. Use signage to encourage drivers to park in parking garages, and to experience Downtown on foot. Make signage to find Downtown parking easy to see and understand. Encourage dynamic signs for parking facilities that announce how many parking spaces remain in a parking garage and, if fully occupied, direct motorists to other alternatives.

e. Near BART and other major arrival points, consider using electronic signs and freestanding kiosks with dynamic presentations. Monitors might be placed in vacant storefronts or be incorporated into public art.

f. Develop a consistent, legible and logical palette of directional signs and icons to provide ways to find major destinations more easily. Develop wayfinding for people of all abilities, including people with limited eyesight.

g. Consider alternatives to conventional signs, such as metal plaques, sidewalk metal inlays, and terrazzo designs to describe Downtown destinations, historic resources, notable geographic features, and other community assets. Such features should reinforce Downtown's identity as a center for culture and the arts.

h. Where possible, take advantage of vistas or "directed views" by placing signs along common paths of travel.

i. Create a prominent visitors information center in or near BART Plaza, and possibly near the east end of University Avenue because of its direct access to Interstate 80 and the UC campus.

j. Work with Downtown organizations to develop walking tours and maps that describe places of interest.

Policy 8.2, Visual Harmony. Signage should be aesthetically consistent maintain visual harmony, to the extent possible.

a. Develop a consistent palette for signage and consolidate signage by using fewer signs and using the same post/pole to mount multiple signs. Develop the consistent palette through a collaborative process that involves City departments, the Downtown Berkeley Association, interested Commissions, and other interested parties. Categories of signs include:

- Traffic & parking operations;
- Transit signs (BART, buses, shuttles);
- Bicycle network;
- Destination & information for all modes;
- Public services (e.g., restrooms);
- Banners; and
- Historic and other interpretive signage.

b. Signage should be easy to understand. When taken as a whole, information should not exceed users' capacity to absorb it.

c. Consider a "hierarchy" of sign size and treatments that correspond with the relative importance of information being communicated. Use color to differentiate different types of information. Limit signage sizes and shapes.

d. Use international icons to the extent possible, because Berkeley is an international city in many respects.

e. In unique locations, consider incorporating one-of-a-kind signs within public art.

Policy 8.3, Placement & Visibility. Signs should be easy to see and should be positioned to promote safety.

a. Signs should meet the requirements of the Municipal Code. These requirements should be reviewed from the perspective of the SOSIP to identify beneficial revisions.

b. Signs should be well-lighted. External sources of light should generally be used, and internally illuminated signs should be avoided because of their visual intensity.

Policy 8.4, Maintaining Quality. Signs should be long-lasting and well maintained.

a. Material and paint selections should be durable and graffiti resistant.

b. Where information may change over time, give consideration to how signs might be updated.

c. Provide adequate resources for the on-going management and maintenance of signs (see Financing & Maintenance chapter).

Figure k.4. International Signs. *International icons are easy to understand and provide a simple consistent look. Icons are available for almost every application (above), and can be part of directional signs (below).*

Figure k.5. Accumulated Complexity. *Signs often detract from Downtown's beauty because of too many styles and "visual clutter." Signs can also be needlessly redundant.*

Direction	Route	Intersection	Major Destinations
From West	University (from I-80)	Milvia	Theater & Art, civic uses
		Shattuck	Blvd Comml, Theater & Art
		Oxford	UC campus directional sign/map
	Dwight	Shattuck	Blvd, cinema
From East	Bancroft	Shattuck	Blvd, cinema
		Milvia	Civic uses
	Haste	Shattuck	Blvd
From South	Shattuck	Durant	Telegraph Ave., UC Admin, UC Professional Schools
		Allston	Civic
		Addison	Theater & Art
		University	UC, University Visitors Facil.
		Hearst	UC, Northside Euclid District
	MLK	Dwight	Telegraph Ave.
		Allston	Civic
		Addison	Theatre and Art
		University	UC Visitors Facilities, Blvd. Commercial
From North	Shattuck	Hearst	Northside, UC Engineering
		University	UC Visitors Facilities, University Blvd
		Addison	Theatre & Art
		Allston	Civic
	MLK	Hearst	Northside, UC Engineering
		University	UC Visitors Facilities, University Blvd
		Addison	Theatre & Art
		Allston	Civic
Transit	BART		Multiple Destinations
	Bus Stops		Multiple Destinations

Table k.1. Wayfinding Decision Locations.

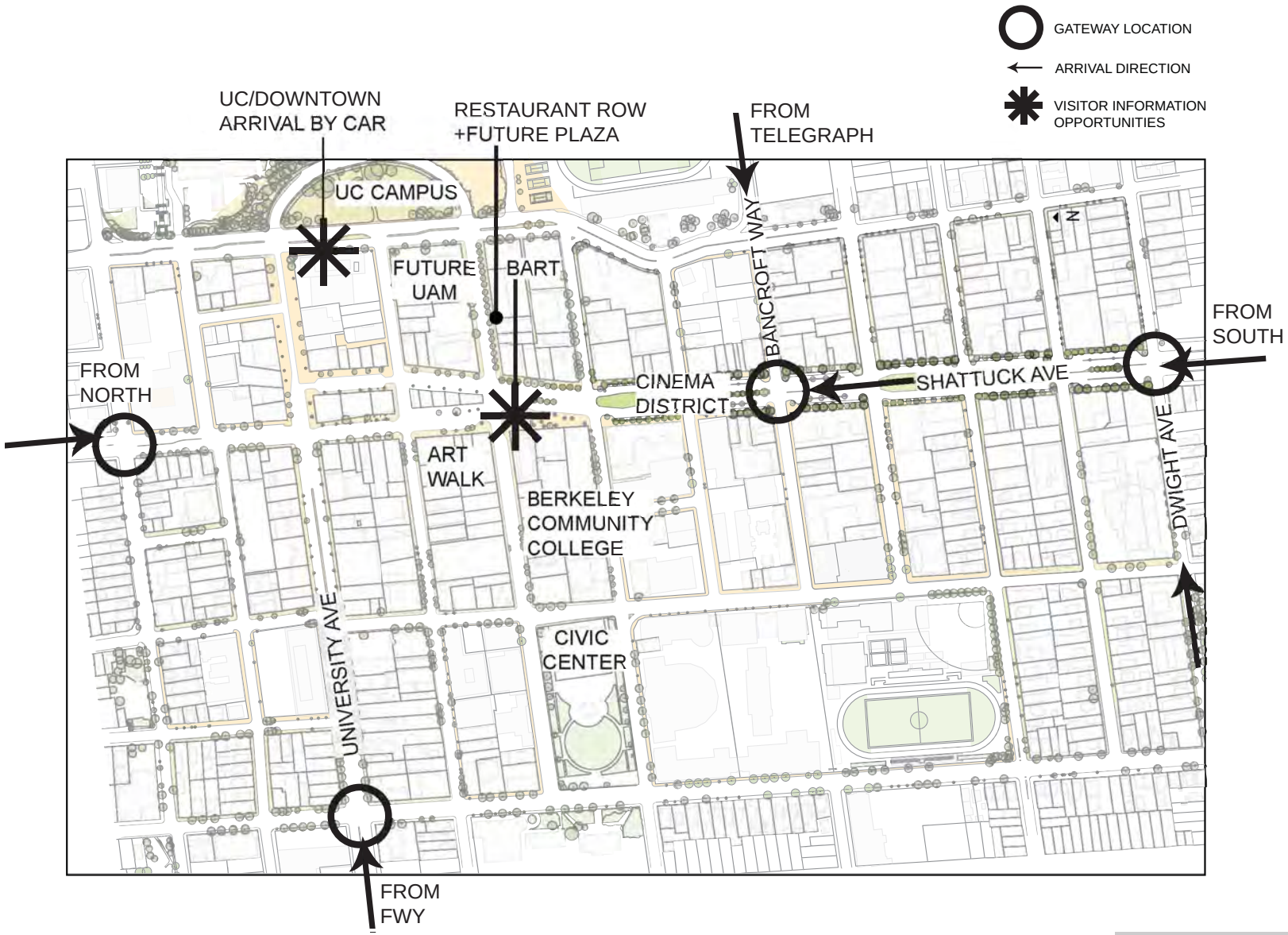


Figure k.6. Major Wayfinding Signage Opportunities. *Signage can announce arrival to the Downtown at BART Plaza and along major streets, especially at "gateway" locations where motorists pass and may need guidance.*

LIGHTING

LIGHTING

PRINCIPAL CONSIDERATIONS

Nighttime Activities. Lighting illuminates and supports nighttime activity. The quality of lighting is critical for the safety of motorists, bicyclists and pedestrians. Well-lighted places also deter crime and unwanted behavior, and well-lighted places are perceived as more secure. Pedestrian-scaled lighting is especially important along paths to major evening destinations, such as BART, parking garages, and evening destinations, such as theatres, cinemas, nightclubs, and restaurants -- and can help increase economic activity Downtown.

Placemaking Potential. At night and during the day, the style of light fixtures and poles has a significant impact on the character of urban areas. For urban districts and corridors, a consistent style provides visual continuity that helps harmonize varied facades and conditions. Within a generally unified lighting scheme, the style of lighting can be varied to accentuate unique subareas, as has been done within portions of the Civic Center Historic District. Also note that lighting with large horizontal overhangs, such as existing “cobrahead” fixtures, create visual interruptions that may be avoided with other types.

Facing Page: Lighting & Placemaking. *The intensity, scale, and aesthetic quality of lighting play an important role in making downtowns more distinct and successful, as has been the case along State Street in Chicago.*

Figure I.1. Light Intensity & Pedestrian Activity. *Pedestrian-oriented lighting attracts people and helps them feel at ease (top). Not all Downtown street segments have adequate lighting, as illustrated by parts of Shattuck Avenue (below).*

Figure I.2. Energy Efficient Technology. *LEDs generate a lot of light with little electricity. Reflectors accompany LEDs to illuminate larger areas, and can be designed to be compatible with traditional light fixtures.*

POLICIES AND ACTIONS

Policy 9.1, Light Intensities & Distribution. The form and placement of lighting and the quality of light should promote attractive, distinctive and safe environments Downtown. At the same time, lighting should not create a nuisance for residents nor should it needlessly contribute to light pollution (also known as "sky glow").

a. City Standards. Lighting shall meet City standards described in the Municipal Code, including standards for travel lanes. Pedestrian areas should be well lighted, and the light intensity of pedestrian areas should generally exceed City standards. All lighting proposals shall be subject to review and approval by Berkeley's Department of Public Works.

b. Lighting Priority. Give priority to installing new pedestrian-scale lighting along paths to major evening destinations, such as BART, entertainment venues, and parking garages.

c. Lighting Master Plans. So that lighting can be installed in a coordinated fashion, the City should develop lighting master plans during the design development phase for major project subareas. The master plans should apply these design guidelines, and attain appropriate levels of illumination by determining the exact location, height and intensity of fixtures. In locations outside of major project subareas, lighting improvements should also be defined through technical analysis and conform with these guidelines to the extent possible.

d. Placement. Street lighting poles should generally be placed near curbs and in line with street trees. Poles may also be needed in other locations, such as for the illumination of traffic lanes and to illuminate parks, plazas and sidewalks of exceptional width. Lighting is recommended where midblock pedestrian paths meet public sidewalks.

e. Fixture Heights. The height of fixtures and poles should emphasize pedestrian activity to the extent possible, while also providing sufficient illumination for the safety of bicycles and vehicles. Generally, new fixtures should not exceed a height of 16 feet to optimize pedestrian-level lighting and placemaking. To provide sufficient illumination for motorists and bicyclists, taller fixtures should be used at intersections and in select midblock locations, as is determined through technical analysis. At intersections, taller poles should also be used for mounting traffic signals to the extent possible, so that the number of poles is minimized.

f. Fixture Spacing. The spacing of fixtures should be determined through technical analysis, and should consider pedestrian-scaled fixtures in midblock locations to the extent possible.

g. Maintenance. When specifying a lighting fixture, ease of maintenance should be evaluated, such as efforts associated with replacing lamps.

h. Glare and Light Pollution. Each light fixture should direct its light toward the areas that it serves. Light fixtures should use "cut-offs" and other devices to shield the light source when seen from upper-story

residential units in mixed-use areas. In residential areas, ground floor units should be shielded. Directing light downward also mitigates "sky glow," the cumulative aesthetic impact from urban light sources. (See also "Placement, Height & Spacing.")

i. Trees. Nearby trees' lowest branches should be pruned to a 14-foot minimum over vehicle lanes and an 8-foot minimum over pedestrian paths of travel (see Street Trees & Landscaping chapter). Where frequent light fixtures are called for, a higher minimum may be needed to adequately illuminate streets and sidewalks.

Policy 9.2, Energy Efficiency. The City should continue to use energy-efficient fixtures, and should seek to use more efficient technologies as they become technically adequate and cost effective. For lighting, energy efficiency should be measured as a function of

Figure I.3. Traditional Light Fixtures. *Traditional "acorn" light fixtures are extensively used and complement Downtown's historic resources (left). To accentuate the Civic Center Historic District, different historic light fixtures were selected (right).*

Figure I.4. Banner Signs. *Banner signs can announce special districts with relatively little expense (above), and take up no space on the ground because they are mounted on light poles (below).*

light output per watt, rather than the wattage of a fixture. Light output is best measured by considering the surfaces that a fixture should illuminate.

a. Continue to improve energy efficiency while addressing safety and other community needs. New technologies, like LEDs, should be considered and used if their relative performance and costs (both capital and on-going costs) are competitive.

b. Optical systems should direct light to where it is needed, and minimize light on other surfaces.

Policy 9.3, Character & Identity. Light fixtures and poles should have a consistent appearance throughout the Downtown Area and reinforce Downtown's historic character (see also Street Furnishings & Other Amenities, Policy 6.3, Visual Consistency). In addition, lighting types and characteristics should be well suited to the activities they support, and make Downtown more vibrant.

a. Traditional Appearance. To accentuate Downtown's historic character, existing "acorn" light fixtures, poles and base covers should be maintained and expanded in the Downtown Area – with pole height varying as needed and horizontal arms used where needed for traffic signals.

b. Civic Center. On street segments within and abutting the Civic Center Historic District, Civic Center Park and the Civic Center Building, the style of historic light fixtures should be maintained and expanded.

c. Other Exceptions. Exceptions may also be made to help specific streets and plazas stand out, but exceptions should generally not be made where historic resources are concentrated: on Shattuck between Berkeley Way and Durant Street, and on University Avenue east of Shattuck.

d. Cobrahead Lighting. Traditional lighting should replace existing cobrahead lighting to the extent feasible. Generally, the replacement of cobrahead lighting will necessitate additional light standards and more frequent spacing. Where cobrahead lighting must be retained, they should be repainted to be consistent with other street elements (i.e. forest green).

e. Banners. Banners are encouraged to define distinct subdistricts in Downtown, especially where cobrahead lighting is retained. Review standards for banners to maximize their size. Banners with colorful and iconic images are encouraged, and might be developed by local artists. Small and illegible features should be avoided.

f. Bollards. Lighting bollards are recommended to illuminate pedestrian paths that are away from street lighting. Bollards should generally be 36 inches tall with the light source and horizontal louvers at the top. Their style and color should be consistent with other street elements.

g. Color. The City should use full-spectrum metal halide lamps along pedestrian paths, unless a cost-effective low-energy equivalent is identified. Full-spectrum light makes colors easier to see and places more inviting. High-pressure sodium lamps are yellow glow and may continue to be used to illuminate traffic lanes, because they are energy efficient and easy to maintain, un-

less a cost-effective low-energy full-spectrum alternative is identified.

h. Evening Destinations. Install additional lights around the BART rotunda and Addison Street by hanging lamps on cables that are attached to light poles and, if feasible, buildings. Consider other ways to increase lighting near entertainment venues.

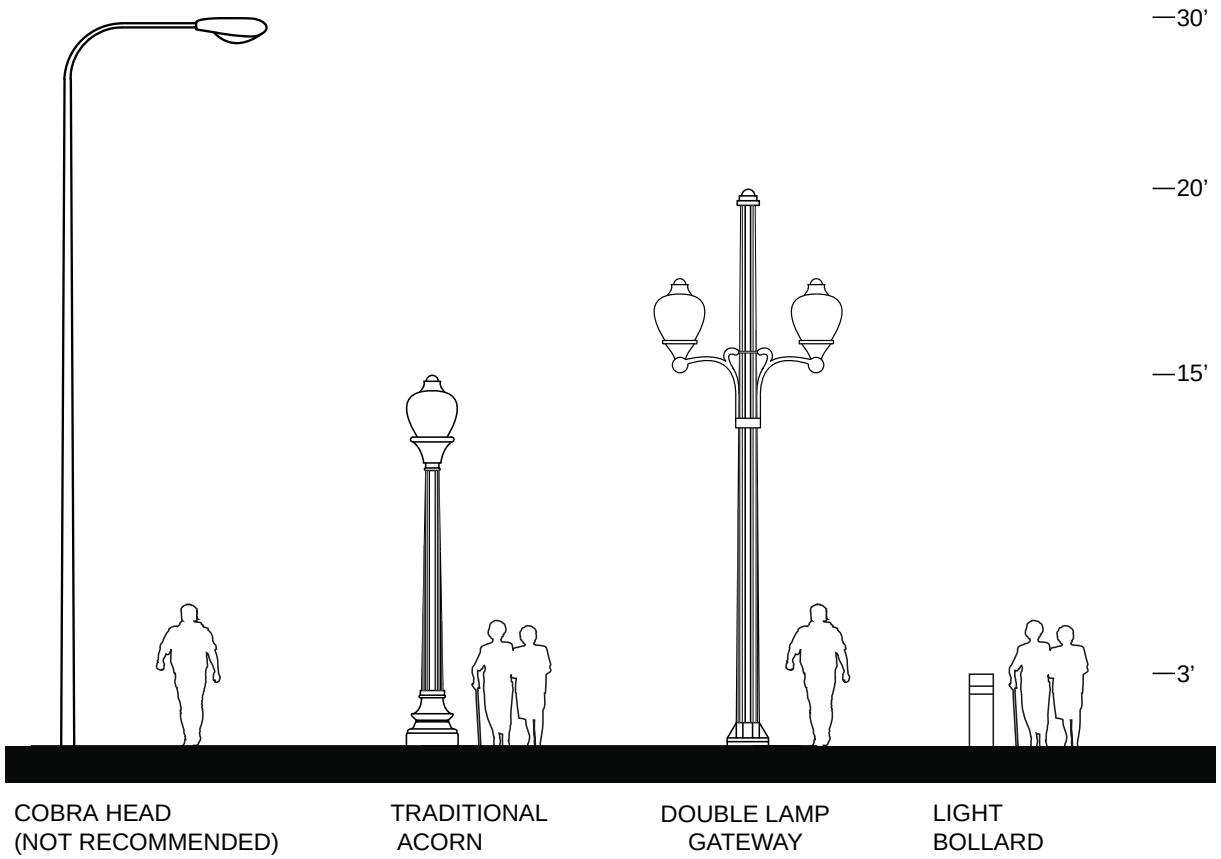


Figure I.5. Light Poles & Fixtures. *Light poles and fixtures vary in scale and character. Cobrahead fixtures (left) are the tallest and have a spare modern appearance. Traditional acorn lighting typically has only one fixture but can have two for additional light or visual emphasis. Light bollards light pedestrian paths directly.*

OPERATIONS & MAINTENANCE

OPERATIONS & MAINTENANCE

PRINCIPAL CONSIDERATIONS

Downtown's success as a destination and a place to live and work depends upon the ability to keep streets, parks, and plazas clean, attractive, and hazard free. Public spaces that are well cared for support economic development, discourage vandalism, and communicate community pride.

While the principle focus of the SOSIP is on capital improvements, this chapter promotes effective maintenance of what is in place and what will be built. The City maintains extensive public open space. These operations require considerable resources, especially in urban settings where there is more activity, wear-and-tear, and vandalism, and where special features and amenities take additional care.

Several types of maintenance strategies must be implemented to sustain improvements over time. First, maintenance needs to be adequately funded. Substantial human and equipment resources will be needed to keep Downtown clean and in good repair. Future maintenance costs and funding are addressed in the SOSIP Financing Plan (the following chapter).

The SOSIP also recommends ways to evaluate and improve maintenance practices. Review of maintenance practices may reveal ways to make them more effective and more consistent with SOSIP's economic, social, and environmental goals. For example, the SOSIP calls for the implementation of innovative features like permeable paving and shared streets. The maintenance of Downtown features should be considered in advance – not just to inform their design but also to anticipate future maintenance needs.

Facing Page: Ongoing Efforts. *City crews work hard to keep streets and open space clean and inviting. Significant City resources are devoted to these efforts.*

POLICIES AND ACTIONS

Policy 10.1. Project Design & Maintenance. Integrate future maintenance considerations into the design and engineering of street and open space improvements. Strive to minimize future maintenance costs while meeting SOSIP goals and design objectives. Consider life-cycle costs such as how on-going maintenance may reduce the need for expensive reconstruction or replacement.

a. Design and engineering teams that are selected for Downtown projects should be qualified to evaluate and address maintenance concerns.

b. Design and engineering alternatives should be developed to explore and encourage ways to reduce on-going maintenance costs. Recognize that water and mechanical features tend to be accompanied by higher costs. Consider ways to abate costs associated with graffiti and vandalism.

c. The maintenance costs of design and engineering proposals should be estimated and cost-saving refinements should be considered before projects are finalized.

d. After public improvements have been implemented, maintenance activities should be recorded and evaluated for potential cost savings. A similar evaluation should

be performed after two years of regular use.

Policy 10.2. Maintenance Practices. Promote effective maintenance practices.

a. Refer to other chapters for specific recommendations relating to maintenance.

Policy 10.3. Leveraging Resources. Consider ways to leverage maintenance resources more effectively.

a. Evaluate how maintenance activities are assigned and whether refinements could further leverage limited resources. Consider alternatives for reducing costs, such as finding new economies of scale, assigning activities to merchants or volunteers, and/or using new techniques or equipment. Address how new needs should be addressed, such as the maintenance of green infrastructure and shared streets.

b. Coordinate with the Downtown Berkeley Association, UC Berkeley, Berkeley Unified School District, East Bay Municipal Utility District, and other entities that are involved with maintenance activities Downtown, and pursue opportunities to attain efficiencies and share maintenance costs fairly.

Figure m.1. Persistent Demands. *To maintain their appeal, urban places require frequent cleaning and maintenance.*

FINANCIAL STRATEGIES

FINANCIAL STRATEGIES

PRINCIPAL CONSIDERATIONS

SOSIP and Downtown's Revitalization. Enhancements to the "public realm" can serve as a major cornerstone for Downtown revitalization, as they have in numerous other communities. The street and open space improvements envisioned will transform Downtown and can give Berkeley a special edge as it competes as a destination within a regional marketplace. Because public improvements can be expected to enhance the whole experience of visiting Downtown, they will elevate Downtown as a preferred destination for shopping, dining, or going to a show.

Public improvements will also make Downtown a more desirable place to live or locate a business, and will attract private investment in building renovations and new construction. Private development will help bring more people Downtown. As incremental public and private investments build on each other, they should set in motion an "upward spiral" leading to Downtown's resurgence and expanding Berkeley's tax base.

Street and open space improvements will also make Downtown more accessible and reduce the frustration that many people feel when they come Downtown. They will encourage walking, bicycling and transit use. In combination with parking & transportation programs, street and open space improvements also have the potential to reduce parking demand and make parking more available for those who chose to drive.

Facing Page: Financing Implementation. *Addressing Costs. Construction costs and on-going expenses must be addressed with funding from grants, fees, and other revenue sources.*

Financial Overview. Significant investment will need to be made to realize the benefits noted and others. While controlling costs was factored into SOSIP design concepts, most street and open space improvements will be expensive – not just to build but also to maintain.

Financial resources for implementing SOSIP are limited, especially City funds for which there are numerous demands. If the SOSIP goals are to be achieved, a broad set of financial strategies will be needed to set priorities, obtain grants, harness private and institutional development, and leverage limited public funds.

Setting Priorities. The SOSIP presents a long-term vision for Downtown, with a total estimated cost of $35 million (2010 dollars). As there are no sources that can fund improvements at this scale, the City will have to make improvements incrementally over time. It is therefore necessary to establish priorities for SOSIP projects.

To best leverage limited resources, the SOSIP sets funding priorities that approach $9 million in capital costs and, if completed as a whole, about $300,000 in additional maintenance costs. SOSIP funding priorities are described in the Major Projects chapter, and are based on a "Project Cost & Financing Report" by Economic & Planning Systems (Appendix B). To set context for the Financing Strategy

chapter, the approximate capital costs for priority projects are summarized below.

Tier I (highest priorities):

- Center Street Plaza (Phase 1)
  $3.4 million
- Shattuck Square & University Avenue
  $1.9 million
- Street Tree Planting Program
  $0.5 million

Tier II:

- Allston-Kittredge Park Block
  $1.0 million
- Hearst/Ohlone Greenway (Phase 1)
  $0.8 million

Tier III:

- Milvia Bike Lanes & Traffic Calming
  $0.6 million
- Shattuck Avenue Bike Lanes
  $0.5 million

The location of future private development will also dictate where improvements are made. As a comprehensive vision, the SOSIP is expected to help the City capitalize on these types of opportunities when they occur.

Potential Funding Sources

Possible new funding sources are described below. While all sources merit further consideration, some funding mechanisms would be much more difficult to establish than others. Especially challenging are those funding sources that would require approval by a super-majority of all Berkeley voters. There are also numerous competing demands on the City's limited capacity to raise money for a variety of capital and service needs. It is assumed in this report that the existing very challenging budget climate for local jurisdictions in California will continue for the foreseeable future, and that funding for SOSIP improvements must come from "new" sources.

Funding sources that could be fully dedicated to SOSIP improvements include grants and development-related fees. This could include in-kind contributions, or fees on development by institutional and nonprofit landowners, such as UC Berkeley. While it is impossible to predict the rate at which these funds would become available, historic rates of development and prior success with grant applications suggest that these funds might "accumulate" at an average annual rate of one-half to one million dollars per year. These types of funding are nearly always limited to capital improvements (i.e. costs associated with project development and construction), and not for ongoing maintenance and operation.

Potential use of revenue from parking meters and City taxes is described below; however, consistent with the Downtown Area Plan's Goal ED-12.1, Revenues for Downtown, the City must balance the needs of all neighborhoods and commercial areas, while at the same time remaining committed to investing resources in the Downtown.

Grants. Grant funding is obtained through competitive applications to non-profits, foundations and government agencies. SOSIP projects may compete well since SOSIP projects

address objectives found in many grants, such as: enhancing pedestrian & bicycle routes to transit; promoting stormwater quality and watershed health; encouraging affordable housing near transit; and revitalizing urban centers. Funding from other sources – or "matching funds" -- is typically needed to receive grants. As noted above, the City has had some success over the years in applying for such funds, recently receiving $2.2 million for BART Plaza improvements. The City also helped fund improvements on Addison and Center Streets in recent years.

Development Impact, "In-Lieu" Fees, & Adjacent Improvements. Developers can be assessed impact fees to address increased demand for open space and other facilities, which result from development. These fees can only go toward capital improvements and must be scaled so as not to exceed the fair share cost of impacts as established by a State-required nexus analysis.

Developer fees might also come, if developers opted to pay an "in lieu" fee instead of providing "on-site" open space as required by Berkeley's Zoning Ordinance. The City would use these in lieu fees to make open space improvements in public rights-of-way and other public land within Downtown.

In addition, developers can be required to make improvements to public right-of-ways that abut development sites consistent with adopted plans. These improvements include construction of new sidewalks, installing street trees and other improvements that directly benefit the development project.

UC Berkeley would be treated in a manner consistent with other institutional and "nonprofit" developers. As such, UC Berkeley might make improvements to abutting streets – consistent with adopted plans and as required of private developers -- or might participate in area-wide development impact fees.

New On-Street Parking Revenues. Increasing the price and extending the hours of on-street parking meters for high demand portions of Downtown could also provide a source of additional funds for SOSIP improvements and maintenance. Since parking revenues are ongoing, they could be well suited to addressing long-term expenses for operations and maintenance for the new improvements proposed in the SOSIP. In the near term, such funds could be used to construct some proposed SOSIP improvements.

In addition to providing a source of revenue, various studies have shown that increasing the cost of on-street parking can help ensure the availability of on-street parking in high-demand areas as drivers choose to park in garages or use alternative transportation, thereby leaving room on the street for short-term users. The concern that price increases may discourage some commercial and cultural patrons from coming Downtown can be mitigated by strengthening Downtown as a destination by spending a significant part of new parking revenues to SOSIP improvements and maintenance. As indicated in DAP Goal ED-12.1, the extent to which new parking revenues could be committed to SOSIP requires a policy discussion that would consider the SOSIP projects in the context of funding needed for Downtown parking/transportation programs and other citywide priorities, and will be considered as part of the annual budget adoption.

Transient Occupancy Tax. Another potential source of funding for SOSIP improvements is the City's Transient Occupancy Tax (TOT),

a tax placed on hotel rooms (and other rooms rented to "transients") in the City. A new hotel might be built in the Downtown within the timeframe of this Plan, and could generate significant TOT taxes. Since Downtown improvements would enhance the City's ability to attract a new hotel and since a new hotel project would increase TOT revenues, it may make sense to commit some portion of new TOT revenues to SOSIP maintenance demands. However, since by law taxes such as the TOT must go to the City's General Fund, unless a Special Tax were approved by two-thirds of Berkeley voters. Therefore, use of TOT funds can only be made in the context of other General Fund priorities.

Citywide Parks Tax. A "Parks Tax Fund" covers a portion of the Parks, Recreation & Waterfront Department operations and the maintenance, and is paid for through property-based assessments. The existing Parks Tax will not be adequate to maintain the new facilities recommended in this plan, even with increased revenues that will come from new development. Additional tax revenues could be obtained if approved by two-thirds of Berkeley's voters and could be devoted to construction and maintenance of new facilities (in Downtown and/or elsewhere), and improvements to existing facilities. As with consideration of any citywide tax measure, the Council will have to weigh the capital needs of parks and open space with the other infrastructure and service needs of the City.

Community Facilities District. Under California's "Mello-Roos" Act, Community Facilities Districts (CFDs) can be formed by local agencies to impose special taxes on property owners, but must first be approved by a super-majority of all Berkeley voters if applied citywide, and by a super majority of property owners if applied only to Downtown. To fund improvements, the City could try to establish a new Community Facilities District (CFD) for Downtown alone, or for the whole city. citywide CFD the special tax could support Downtown improvements and possibly associated maintenance. Although CFD's have been commonly used in the creation of large new subdivisions where involving only a single developer / property owner, they are used very occasionally in situations where there are many existing property owners, such as in Downtown Berkeley.

Business Improvement District. Downtown's business community makes important contributions through day-to-day provision of goods, services and events, and promotes revitalization through a property-based business improvement district (PBID). Administration of the PBID is contracted by the City to the Downtown Berkeley Association (DBA), which in 2009, began exploring how to transform the previous merchant-based BID into a PBID. The PBID proposal incorporated a bigger geographic area and generated a larger annual budget that was intended to have a transformational impact on the district's character.

In 2011, the PBID was approved by a majority of participating property owners and adopted by the City Council. PBID priorities include enhanced security, cleaning & maintenance of public spaces, shared marketing and economic development. PBID efforts complement and might supplement SOSIP operations and maintenance activities, but it is very unlikely that a BID could raise significant capital for implementing the SOSIP.

POLICIES AND ACTIONS

Policy 11.1, SOSIP Funding. Establish funding sources for SOSIP capital improvements. as well as ongoing SOSIP maintenance & operational needs.

a. Aggressively pursue external grant funding from foundations and regional, state, federal governments, and foundations sources. Recognize that other funds may be needed to provide local "matching funds," and include the need for matching funds as part of an overall SOSIP financing strategy.

b. Adopt a new Development Impact Fee to implement the SOSIP. Base this fee on a rational nexus that aligns fees with the impacts of new development, as required by California law.

c. Establish an option for developers to pay a fee in-lieu of meeting some portion of on-site open space requirements. Proceeds from in-lieu fees should be spent on SOSIP improvements. Consider how development can assume a fair-share burden for on-going maintenance costs, since required open space – if provided entirely on-site – would have been maintained by the developer.

d. Require developers to make improvements to abutting streets as a condition for approval. Required improvements should conform to SOSIP provisions and design concepts, unless superseded by design development associated with Major Projects or by other development standards. The City should set high standards for these improvements.

e. Pursue Institutional and Non-Profit Cost Sharing. Contributions from institutional and non-profit uses, such as UC Berkeley, the Berkeley Public Library, or the Berkeley Unified School District, Berkeley Community College, or local theaters and performance venues, should be pursued in a manner consistent with requirements on all projects developed by "nonprofit" institutions.

f. Consistent with DAP Goal ED-12.1 and as part of the annual City budget adoption, consider the extent to which new on-street parking meter revenues in Downtown could be dedicated to long-term maintenance and near-term capital improvements to implement the SOSIP. Because parking revenues are on-going, recognize the importance of new parking revenues in addressing maintenance costs. In the near-term, before SOSIP improvements come on line and require maintenance, consider using parking revenues for capital improvements or as matching funds for grants.

g. Consider a developer fee for transportation impacts. If established, dedicate a portion of revenues to SOSIP improvements that would calm traffic, strengthen Berkeley's bicycle network, and enhance pedestrian routes to transit.

h. If an increase in Berkeley's Parks Tax is considered by the voters, include some SOSIP improvements in any list of projects that may be implemented with these new revenues.

i. Continue to evaluate the feasibility of other funding mechanisms. State legislation occasionally modifies requirements on funding

mechanisms that make them easier to apply, and an unpromising environment for any particular mechanism can change. The City should be opportunistic in considering funding mechanisms for SOSIP implementation.

Policy 11.2, Near-Term Priorities. Concentrate efforts and funding in pursuit of the near-term priorities described in the chapter on Major Projects (Policy 1.3).

a. Pursue financial strategies that target SOSIP's near-term priorities, while adjusting the timing of SOSIP projects to take full advantage of funding opportunities from future grants and development.

Policy 11.3. Coordination. Coordinate SOSIP funding and activities with other related initiatives to best leverage limited resources.

a. Support the Downtown Berkeley Association as it administers the Property-based Business Improvement District (PBID) funds to address needs such as removing litter, washing sidewalks, maintaining landscaping, etc.

b. Consider BID and SOSIP initiatives in concert to find ways to maximize benefits.

ACKNOWLEDGEMENTS

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Teresa Clarke, Planning Commission

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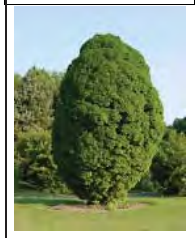
APPENDIX

	SCIENTIFIC NAME COMMON NAME 'CULTIVATED VARIETY'	TYPE: EVERGREEN	TYPE: DECIDUOUS	TYPE: CONIFEROUS	TYPE: PALM	HEIGHT: UP TO 15'	HEIGHT: 15' – 30'	HEIGHT: 30' – 50'	HEIGHT: OVER 50'	CROWN SPREAD: 20' OR LESS	CROWN SPREAD: 20' – 30'	CROWN SPREAD: 30' +	SHAPE: ROUND	SHAPE: SPREADING	SHAPE: COLUMNAR	SHAPE: OVAL	SHAPE: UPRIGHT	SHAPE: PYRAMIDAL	FOLIAGE DENSITY: OPEN	FOLIAGE DENSITY: MEDIUM	FOLIAGE DENSITY: DENSE	TEXTURE: FINE	TEXTURE: MED	TEXTURE: COARSE	SPACING: 20' – 30'	SPACING: 30' – 40'	SPACING: 40' +	EXPOSURE: SUN	EXPOSURE: SUN-SHADE	EXPOSURE: SHADE	TOLERANCE: DROUGHT	TOLERANCE: WIND?	TOLERANCE: OAK ROOT FUNGUS	LIFE OF TREE: 20-40 YRS	LIFE OF TREE: OVER 40 YEAS	OUTSTANDING CHARACTERISTICS: AROMATIC	OUTSTANDING CHARACTERISTICS: ATTRACTS BIRDS	OUTSTANDING CHARACTERISTICS: FRUIT/ FLOWER	OUTSTANDING CHARACTERISTICS: FALL COLOR	OUTSTANDING CHARACTERISTICS: UNUSUAL LEAVES	PARKWAY STRIPS: 2' TO 4'	PARKWAY STRIPS: 4' TO 6'	PARKWAY STRIPS: OVER 6'	EXISTING LOCATIONS: RETROFIT COMM 2 LANE	EXISTING LOCATIONS: RETROFIT COMM 1 LANE	EXISTING LOCATIONS: REDIDENTIAL	EXISTING LOCATIONS: NEW COMMERCIAL	COMMENTS
	**ACER BUERGERANUM** TRIDENT MAPLE		●				●				●		●							●		●			●				●			●			●								● 2		REQUIRES MOIST SOILS, STAKE AND PRUNE TO DEVELOP HIGH BRANCHING MODERATE GROWTH RATE; DENSE ROUNDED CROWN; OFTEN MULTI-TRUNKED OR LOW BRANCHING, BUT CAN BE TRAINED TALLER WITH STAKING & PRUNING; CLEAN, ATTRACTIVE, SMALL PARK OR STREET TREE; PREFERS MODERATE MOISTURE; TOLERANT OF MOST SOILS; RELATIVELY PEST FREE; ESTIMATED LIFESPAN 100-150 YRS
	**ACER CAMPESTRE** HEDGE MAPLE 'QUEEN ELIZABETH'		●				●				●							●							●												●									SLOW GROWTH RATE; SLENDER AT 1ST, THEN DEVELOPING TALL, ROUND-TOPPED, OVAL FORM; DENSE CLUSTERS OF LONG STEMMED SEED ARE NOTICEABLE FROM SUMMER THRU WINTER; SMALL STREET, PARK, OR PATIO TREE; TOLERATES INLAND HEAT IN CA WITH MODERATE MOSITURE IN FERTILE SOILS, BUT MAY NOT BE AS VIGOURS OR SHAPELY & FALL COLOR USU IS BARELY NOTICEABLE; LOWER BRANCHES CAN BE PRUNED UP AS TREE BECOMES TALLER & PRODUCES MORE TOP GROWTH, BUT MUST BE CUT CLEANLY TO PREVENT SUCKERING; EST LIFESPAN 100-175 YRS; QUEEN ELIZABETH IS IMPROVED VARIETY BETTER ADAPTED TO URBAN HABITAT
	**ACER PALMATUM** JAPANESE MAPLE		●				●				●		●									●			●			●	●	●	●		●			●						●			● 2		NEED MOIST SOILLS, GOOD UNDERSTORY TREE SLOW TO MODERATE GROWTH RATE; OFTEN WITH MUTLIPLE TRUNKS; GRACEFUL FORM & BROAD ROUNDED CANOPY; FLOWERS AND SEEDS SMALL; PREFERS SEMI-SHADED, MODERATELY MOIST LOCATIONS; SOMETIMES TOLERATES MODERATE FULL SUN, BUT LEAVES MY SCORCH IN HOT DRY LOCATIONS W/O ADEQUATE MOSITURE & PARTIAL SHADE MUCH OF THE DAY; PREFERS MOIST, RICH, WELL-DRAINED SOILS; RELATIVELY FREE OF PESTS AND DISEASE; RESISTANT TO OAK ROOT FUNGUS; SUFFERS IN DROUGHT, WHERE SALT BUILD-UP IN SOIL CAUSE LEAF BURN; EST LIFESPAN 150-200 YRS; MANY CULTIVARS AVAILABLE
	**CARPINUS BETULUS** EUROPEAN HORNBEAM		●					●			●				●					●					●			●	●					●				●			●						NOT SUITABLE FOR WARM CLIMATE, NEEDS MOIST SOIL MAIN SPECIES HAS SMALL FLOWERS; SEEDS LASTING FOR SHORT TIME; UNCOMMON; EST LIFESPAN OVER 200 YRS; PREFERS COLDER WINTER CLIMATES, BUT TOLERATES N CA COASTAL & INLAND CONDITIONS WITH ADEQUATE MOISTURE; REQUIRES MODERATELY MOIST, WELL-DRAINED SOILS; TWO COMMON CULTIVARS: 'COMPACTA' - MODERATE GROWTH RATE; WIDE, DENSE, COMPACT, PYRAMIDAL FORM, BROADING WITH AGE; BEAUTIFUL SMALL, SHADE TREE FOR PARK OR STREETSIDE PLANTINGS; OCCASIONAL SCALE INFESTATION CAN BE TREATED; 'FASTIGIATA' - SLOW TO MODERATE GROWTH RATE; DENSE, UPRIGHT, COLUMNAR TO OVAL VASELIKE FORM, BROADENING WITH AGE; SHORT TRUNK; VERTICAL ACCENT TREE FOR PARK OR STREETSIDE PLANTING; MOST COMMONLY USED HORNBEAM

NOTE: Tree selection for Major Projects will occur seperately

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	**GEIJERA PARVIFLORA** AUSTRALIAN WILLOW	●					●				●		●							●			●			●			●			●				●								● 3	● 2		NON INVASIVE ROOTS, GOOD STREET TREE, NATIVE TO DRIER REGIONS; SLOW TO MODERATE GROWTH RATE; FORMS DENSE, OVAL CANOPY, BROADENING WITH AGE, MAIN BRANCHES SWEEPING UPWARD & OUTWARD & SMALLER BRANCHES DROOPING AT ENDS; SMALL FLOWERS & TINY BLACK SEEDS; GRACEFUL FINE TEXTURED SPECIMEN OR SMALL STREET OR PATIO TREE; TOLERATES SOME DROUGHT, BUT PREFERS MODERATE WATERING & WELL-DRAINED SOILS; DOES NOT PERFROM WELL IN HEAVY, WET SOILS; ROOTS ARE DEEP & NOT INVASIVE; CASTS LIGHT, AIRY SHADE, SIMILAR TO WEEPING WILLOW, BUT BECOMES SPARSE IF OVERLY SHADED; EST LIFESPAN 50-80 YRS
	**KOELREUTERIA BIPINNATA** CHINESE FLAME TREE		●					●				●	●							●				●			●			●	●		●			●	●	●								NEEDS MOIST SOIL SLOW TO MODERATE GROWTH; DEVELOPS BROAD, OVAL FORM, EVENTUALLY WITH A FLATTENED TOP; CLUSTERS OF BRIGHT YELLOW FLOWERS, FLOWERED BY SEED PODS, PERSISTING BRIEFLY; DESIRABLE SHADE OR SMALL STREET TREE; NON-INVASIVE ROOTS; LESS COMMONLY USED THAN . PANICULATA, AS IT IS ONLY HALF-HARDY; DEVELOPS BEST FORM WITH MODERATE WATERING & PRUNING TO DEVELOPE A STRONG TRUNK & CANOPY; WITHSTANDS HEAT, BUT SUFFERS DROUGHT & DOES WELL IN LAWNS; FLOWERS ATTRACT BEES; EST LIFESPAN 75-100 YRS
	**LAGERSTROEMIA X FAURIEI 'NATCHEZ'** WHITE CRAPE MYRTLE 'NATCHEZ'		●					●			●									●						●			●			●					●	●		●							SHOWY WHITE FLOWERS HYBRIDS: MODERATE GOWTH RATE; VIGOUROUS, UPRIGHT BRANCHES THAT ARCH OUTWARD; SHOWY UPRIGHT FLOWERS; HARD SHELLED SEEDS PERSISTS TO WINTER; RESISTANT TO POWDERY MILDEW; HARDINESS; VARIETIES BASED ON FLOWER COLOR & SIZE; ALL DO BEST IN WELL-DRAINED FERTILE SOILS WITH DEEP WATERING; EST LIFESPAN 100-175 YRS
	**MAGNOLIA GRANDIFLORA 'LITTLE GEM'** SOUTHERN MAGNOLIA 'LITTLE GEM'	●					●			●										●						●	●					●					●			●				● 1		● 2		COMPACT MAIN SPECIES SLOW TO MODERATE GROWTH RATE; DEVELOPES TOWERING, ROUND-TOPPED; DENSE CANOPY; LARGE FRAGRANT FLOWERS; FRUITS UNUSUAL; EVENTUALLY BECOMES MAGNIFICENT ST OR LAWN TREE; OLDER TREES REQUIRE LITTER CLEAN-UP THROUGHOUT THE YEAR; NEEDS AMPLE ROOM; HEAVY SURFACE ROOTS 7 DENSE SHADE MAKE PLANTING UNDERNEATH DIFFICULT; EST LIFESPAN 150-200 YRS; 'LITTLE GEM' IS SMALLER THAN USUAL; HABIT COMPACT & NARROWLY UPRIGHT; NEEDS SUMMER HEAT TO THRIVE; POOR IN COOL-SUMMER REGIONS DUE TO FUNAL SUSCEPTIBILITY WHICH MAKES THE TWIG TIPS DIE BACK; 'ST. MARY' IS DENSE THOUGH SMALL & A HEAVY BLOOMER; MOST COMMON CULTIVAR IN US; BUSHY CORWN YET IS NO DWARF; FLOWERS ABUNDANT; BLOOMS YOUNG;

		EVERGREEN	DECIDUOUS	CONIFEROUS	PALM	UP TO 15'	15' – 30'	30' – 50'	OVER 50'	20' OR LESS	20' – 30'	30' +	ROUND	SPREADING	COLUMNAR	OVAL	UPRIGHT	PYRAMIDAL	OPEN	MEDIUM	DENSE	FINE	MED	COARSE	20' – 30'	30' – 40'	40' +	SUN	SUN-SHADE	SHADE	DROUGHT	WIND?	OAK ROOT FUNGUS	20-40 YRS	OVER 40 YEAS	AROMATIC	ATTRACTS BIRDS	FRUIT/ FLOWER	FALL COLOR	UNUSUAL LEAVES	2' TO 4'	4' TO 6'	OVER 6'	RETROFIT COMM 2 LANE	RETROFIT COMM 1 LANE	REDIDENTIAL	NEW COMMERCIAL	
	SCIENTIFIC NAME COMMON NAME 'CULTIVATED VARIETY'	**TYPE**				**HEIGHT**				**CROWN SPREAD**			**SHAPE**						**FOLIAGE DENSITY**			**TEXTURE**			**SPACING**			**EXPOSURE**			**TOLERANCE**			**LIFE OF TREE**		**OUTSTANDING CHARACTERISTICS**						**PARKWAY STRIPS**			**EXISTING LOCATIONS**				**COMMENTS**
	**LAGERSTROEMIA X FAURIEI 'NATCHEZ'** WHITE CRAPE MYRTLE 'NATCHEZ'		●					●			●									●					●			●			●						●	●		●							SHOWY WHITE FLOWERS HYBRIDS: MODERATE GOWTH RATE; VIGOUROUS, UPRIGHT BRANCHES THAT ARCH OUTWARD; SHOWY UPRIGHT FLOWERS; HARD SHELLED SEEDS PERSISTS TO WINTER; RESISTANT TO POWDERY MILDEW; HARDINESS; VARIETIES BASED ON FLOWER COLOR & SIZE; ALL DO BEST IN WELL-DRAINED FERTILE SOILS WITH DEEP WATERING; EST LIFESPAN 100-175 YRS
	**MAGNOLIA GRANDIFLORIA 'SAINT MARY'** SOUTHERN MAGNOLIA 'SAINT MARY'	●					●			●				●							●			●	●	●		●					●					●			●							MAIN SPECIES SLOW TO MODERATE GROWTH RATE; DEVELOPES TOWERING, ROUND-TOPPED; DENSE CANOPY; LARGE FRAGRANT FLOWERS; FRUITS UNUSUAL; EVENTUALLY BECOMES MAGNIFICENT ST OR LAWN TREE; OLDER TREES REQUIRE LITTER CLEAN-UP THROUGHOUT THE YEAR; NEEDS AMPLE ROOM; HEAVY SURFACE ROOTS 7 DENSE SHADE MAKE PLANTING UNDERNEATH DIFFICULT; EST LIFESPAN 150-200 YRS; 'LITTLE GEM' IS SMALLER THAN USUAL; HABIT COMPACT & NARROWLY UPRIGHT; NEEDS SUMMER HEAT TO THRIVE; POOR IN COOL-SUMMER REGIONS DUE TO FUNAL SUSCEPTIBILITY WHICH MAKES THE TWIG TIPS DIE BACK; 'ST. MARY' IS DENSE THOUGH SMALL & A HEAVY BLOOMER; MOST COMMON CULTIVAR IN US; BUSHY CORWN YET IS NO DWARF; FLOWERS ABUNDANT; BLOOMS YOUNG;
	**NYSSA SYLVATICA** SOURGUM		●				●	●			●				●	●					●			●	●													●					●	8		DISTANTLY RELATED TO DOGWOOD (CORNUS SP.); SLOW TO MODERATE GROWTH RATE; UPRIGHT PYRAMIDAL SHAPE WHEN YOUNG, BECOMING MORE IRREGULAR & SPREADING; SMALL FLOWERS; FRUIT FLESHY & ATTRACTIVE TO BIRDS; EXCELLENT ST, LAWN, PARKWAY OR PATIO TREE; GROWS WELL IN ANY SOIL; TOLERATES ALKALINITY & POOR DRAINAGE; RELATIVELY PEST FREE; DEEP ROOTED, WITH SHALLOW LATERAL ROOTS; LARGER TREES DIFFICULT TO TRANSPLANT; EST LIFESPAN 100-150 YRS
	**PISTACIA CHINENSIS** CHINESE PISTACHE		●					●				●	●			●					●			●			●	●		●	●			●				●	●		●							VERSATILE VERTICILLIM WILT CONCERN UNKNOWN INVASIVE (CA IPC) NATURALIZED IN CA; SLOW TO MODERATE GROWTH RATE; YOUNG TREES DEVELOP DENS OVAL SHAPE, IRREGULAR BRANCHING EVENTUALLY FORMING A FULL ROUNDED CNAOPY WITH LOW BRANCHES SWEEPING TO THE GROUND IF LEFT UNPRUNED; SMALL FLOWERS; SMALL CLUSTERED SEEDS; POPULAR & RELIABLE ST OR SHADE TREE FAVORED FOR ITS ROUNDED CANOPY & BRIGHT FALL COLOR; CONSIDERED AN INVASIVE RESEEDER, BUT NOT A SERIOUS AS SOME OTHERS; TOLERATES DROUGHT & ALKALINITY; RESISTS OAK ROOT FUNGUS & RELATIVELY PEST FREE; OVERWATERING CAN CAUSE VERTICULLIUM WILT; INTOLERANT OF PRUNING, WHICH OFTEN DESTROYS NATURAL FORM, THOUGH LOWER BRANCHES CAN BE REMOVED IF CUT CLOSELY AT THE TRUNK, LEAVING NO STUBS TO SUCKER; EST LIFESPAN 80-100 YRS;

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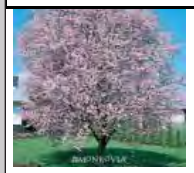
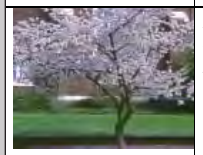
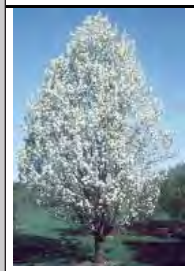
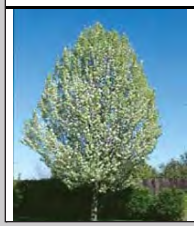
	**PRUNUS CERASIFERA 'KRAUTER VESUVIUS'** PURPLE LEAF PLUM 'KRAUTER VERUVIUS'		●				●			●			●			●	●							●			●	●				●							●				7	● 1 2			MAIN SPECIES NATURALIZED IN US; FAST GROWTH RATE; WIDE BRANCHING CANOPY OFTEN EXCEEDING HEIGHT, USU FORMING A MULTI-TRUNKED, ARCHING VASE IF NOT MAINTAINED; COMMONLY SELF-SEEDING OR SUCERKING FROM GRAFTED ROOTSTOCK; SHOWY WHITE FRAGRANT FLOWERS; JUICY FRUITS BUT BLAND; NOT GENERALLY CULTIVATED FOR LANDSCAPE USE, OR AS A FRUITING TREE, BUT COMMON NONETHELESS; GENERALLY NOT INVASIVE IN LAWNS, THOUGH BIRDS CARRY FRUITS & SEEDS TO NEARBY AREAS; TOLERANT OF ADVERSE CONDITIONS WHEN ESTABLISHED; EST LIFESPAN 50-75 YRS; 'KRAUTER VESUVIUS' - MORE WIDELY PLANTED THAN ORIGINAL; YOUNG LEAVES DEEPER RED & LESS BRONZY-PURPLE; THRIVES BETTER IN THE HOT, DRY SOUTHEAST; GROWS FASTER; DEVELOPS UPRIGHT BRANCHING & OVAL ARCHING CANOPY; LEAVES HOLD THEIR COLOR THROUGH SUMMER; SHOWY FRAGRANT PINK FLOWERS; SETS FEW IF ANY FRUITS; GOOD BRANCHING STRUCTURE; FAIRLY DISEASE RESISTANT; REQUIRES MINIMAL CARE WITH MODERATE MOISTURE IN WELL DRAINED SOILS; LIFE SPAN EST 60-80 YRS
	**PRUNUS YEDOENSIS 'AKEBONO'** AKEBONO FLOWERING CHERRY		●				●				●		●					●						●			●	●							●		●		●							MAIN SPECIES MODERATE TO FAST GROWTH RATE; GRACEFUL, SEMI-ARCHING BRANCHES FROM A SHOURT, STOUT TRUNK; FRAGRANT, SINGLE, WHITE OR PALE PINK FLOWERS IN DROOPING CLUSTERS; 'AKEBONO' - DAYBREAK CHERRY; MORE COLD HARDY; SMALLER TREE BEARING LARGER, PINKER FLOWERS IN FULL BLOOM A BIT LATER IN SPRING, MAKING A DENSER DISPLAY
	**PYRUS CALLERYANA 'ARISTOCRAT'** ARISTOCRAT FLOWERING PEAR		●						●		●		●			●		●					●			●						●		●			●	●		●					● 2		EARLY TRAINING TO PREVENT LOW RADIAL BRANCHING 'ARISTOCRAT' CULTIVAR FAST TO MODERATE GROWTH RATE; DEVELOPS SYMMETRICAL CONICAL TO OVAL SHAPE WITH MULTIPLE UPRIGHT LEADER FROM A STOUT TRUNK & SHORTER HORIZONTAL TO SLIGHTLY UPWARD-ARCHING BRANCHES WITH TWIGGY ENDS; DENSE HEAVILY WHITE FRAGRANT FLOWER CLUSTERS; BIRDS FAVOR SMALL OTHERWISE INEDIBLE FRUITS; COMMONLY USED AS ATTRACTIVE ST & SHADE TREE OR A FLOWERING & FALL COLOR ACCENT TREE; FAVORED FOR ITS NEAT, CLEAN APPEARANCE; MORE COLUMNAR & NARROWER THAN BRADFORD PEAR; VERY SUSCEPTIBLE TO FIREBLIGHT & MISTLETOE; LIFESPAN 70-80 YRS; NARROW BRANCH CROTCHES RESIST STORM BREAKAGE; GROWS FAST; MORE FRUITFALL THAN MANY CULTIVARS; GOOD DISEASE RESISTANCE, EXCEPT VERY FIREBLIGHT SUSCEPTIBLE
	**PYRUS CALLERYANA 'CHANTICLEER'** CHANTICLEER FLOWERING PEAR		●					●		●								●		●				●			●						●	●				●	●		●						EARLY TRAINING TO PREVENT LOW RADIAL BRANCHING 'CHANTICLEER' CULTIVAR HAS VERY TIGHTLY NARROW PYRAMIDAL; SOME MORE COLUMNAR; FALL COLOR USU RED-PURPLE

		EVERGREEN	DECIDUOUS	CONIFEROUS	PALM	UP TO 15'	15' – 30'	30' – 50'	OVER 50'	20' OR LESS	20' – 30'	30' +	ROUND	SPREADING	COLUMNAR	OVAL	UPRIGHT	PYRAMIDAL	OPEN	MEDIUM	DENSE	FINE	MED	COARSE	20' – 30'	30' – 40'	40' +	SUN	SUN-SHADE	SHADE	DROUGHT	WIND?	OAK ROOT FUNGUS	20-40 YRS	OVER 40 YEAS	AROMATIC	ATTRACTS BIRDS	FRUIT/ FLOWER	FALL COLOR	UNUSUAL LEAVES	2' TO 4'	4' TO 6'	OVER 6'	RETROFIT COMM 2 LANE	RETROFIT COMM 1 LANE	REDIDENTIAL	NEW COMMERCIAL	
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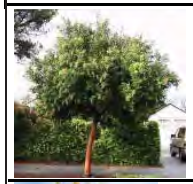
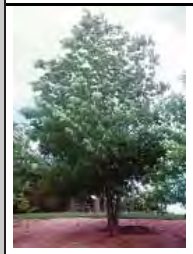
	**RHUS LANCEA** AFRICAN SUMAC	●						●			●			●			●				●				●			●	●		●	●			●			●						● 2		TRAIN WHEN YOUNG MODERATE TO FAST GROWTH RATE; DENSE, OVAL, SPREADING HABIT, OFTEN MULTI-TRUNKED, WITH GRACEFUL, WEEPING BRANCHLETS & DROOPING FOLIAGE; SMALL YELLOW FLOWER CLUSTERS; PEA-SIZED FRUITS; WIDELY PLANTED AS A MEDIUM-SIZED ST, COURTYARD, OR PATIO TREE OR SCREEN WITH AN AIRY, FINE TEXTURE; CAN BE PRUNED UP AS A MULTI-TRUNK SEPCIMENT, EXPOSING ATTRACTIVE BARK; EST LIFESPAN 60-75 YRS OR MORE
	**FRAXINUS OXYCARPA 'RAYWOOD'** RAYWOOD ASH		●					●			●		●							●			●			●			●	●	●	●	●				●	●			●		● 2 1	● 1	● 2		SIDEWALK DAMAGE TRAIN WHEN YOUNG 'RAYWOOD' CULTIVAR WITH FAST GROWTH RATE; UPRIGHT OVAL FORM; SMALL FLOWERS; SEED CLUSTERS RARELY SEEN; WIDELY USED ATTRACTIVE ST, PARKING LOT, OR PATIO SHADE TREE; MAY SUFFER DIEBACK IN DROUGHT; SUSCEPTIBLE TO WIND BREAKAGE; SUSCEPTIBLE TO APHIDS; EST LIFESPAN 90-125 YRS
	**GINKGO BILOBA 'SARATOGA'** GINKGO TREE 'SARATOGA'		●					●				●														●												●			●							MAIN SPECIES PREHISTORIC RELIC, & NOT KNOWN TO EXIST IN THE WILD; SLOW GROWTH RATE; DEVELOPS A BROAD CANOPY WITH SEVERAL ERECT LEADERS & OUTWARD ANGULAR BRANCHING, OR LESS OFTEN, AN UPRIGHT CONICAL FORM; LEAVES DROP QUICKLY IN GUSTY WIND; FEMALES PRODUCE FOUL SMELLING FRUIT; TRUNKS OFTEN BECOME FLUTED AT BASE; EXCELLENT PARK OR ST TREE, OR SINGLE LAWN SPECIMEN; DOES NOT THRIVE IN HEAVY OR SOGGY SOILS; RESISTANT TO OAK ROOT FUNGUS & GENERALLY PEST FREE; EST LIFESPAN 500 YRS OR MORE; 'SARATOGA' - MALE (NO FRUIT); COMMON IN PACIFIC COAST; DENSE, COMPACT HABIT WITH ASCENDING BRANCHES, & DISTINCT CENTRAL LEADER; BUSHY, SLOW GROWTH
	**GLEDITSIA TRIACANTHOS INERMIS 'SHADEMASTER'** SHADEMASTER HONEY LOCUST		●					●				●				●	●	●			●			●			●	●		●		●		●				●	●			●		● 4				ROOTS MAIN SPECIES FAST GROWTH RATE; DEVELOPS UPRIGHT TRUNK, SLENDER, ARCHING BRANCES, & A ROUND-TOPPED CANOPY, CASTING FILTERED SHADE; SMALL FLOWERS; LONG LEGUME SEED PODS; COMMONLY CULTIVATED FILTERED SHADE TREE; SLOW TO LEAF OUT IN SPRING & DROPS LEAVES EARLY IN FALL, CAUSING LITTER PROBLEMS; TOLERATES HEAT, ALKALINITY, & MODERATE DROUGHT; DOES WELL IN HOT CLIMATES WITH SEASONAL CHANGE; CATERPILLAR INFESTATIONS CAN TEMPORARILY DEFOLIATE TREES IN LATE SUMMER; EST LIFESPAN 50-100 YRS; 'SHADEMASTER' - UPRIGHT WITH THE FASTEST GROWTH; THORNLESS; MAY BE PODLESS; HEAVY FOLIAGE HELD LONGER IN FALL THAN THAT OF MOST CULTIVARS; RESISTS DROUGHT; DISEASE FREE; CANKER RESISTANT

		EVERGREEN	DECIDUOUS	CONIFEROUS	PALM	UP TO 15'	15' – 30'	30' – 50'	OVER 50'	20' OR LESS	20' – 30'	30' +	ROUND	SPREADING	COLUMNAR	OVAL	UPRIGHT	PYRAMIDAL	OPEN	MEDIUM	DENSE	FINE	MED	COARSE	20' – 30'	30' – 40'	40' +	SUN	SUN-SHADE	SHADE	DROUGHT	WIND?	OAK ROOT FUNGUS	20-40 YRS	OVER 40 YEAS	AROMATIC	ATTRACTS BIRDS	FRUTI FLOWER	FALL COLOR	UNUSUAL LEAVES	2' TO 4'	4' TO 6'	OVER 6'	RETROFIT COMM 2 LANE	RETROFIT COMM 1 LANE	REDIDENTIAL	NEW COMMERCIAL	
	SCIENTIFIC NAME COMMON NAME 'CULTIVATED VARIETY'	**TYPE**				**HEIGHT**				**CROWN SPREAD**			**SHAPE**						**FOLIAGE DENSITY**			**TEXTURE**			**SPACING**			**EXPOSURE**			**TOLERANCE**			**LIFE OF TREE**		**OUTSTANDING CHARACTERISTICS**					**PARKWAY STRIPS**			**EXISTING LOCATIONS**				**COMMENTS**
	**TRISTANIA CONFERTA** BRISBANE BOX	●						●				●					●			●				●			●	●		●	●		●	●			●				●						NOW KNOWN AS *LOPHOSTEMON CONFERTUS* GOOD FOR NARROW SIDEWALKS INTERNET INFORMATION: NARROW & UPRIGHT FORM WHEN YOUNG, CROWN BECOMING BROAD & ROUNDED WHEN MATURE; PRODUCES SMALL FRAGRANT WHITE FLOWERS; EXTREMELY DROUGHT RESISTANT; EXCEPTIONALLY STRONG, DURABLE TIMBER; TOLERATES ALL SOIL TYES AND HIGH ALKALINITY, FROM SEACOAST EXPOSURE TO HIGH DESERT CONDITIONS; PREFERS WATER IN WELL-DRAINED SOILS WHEN YOUNG, BUT BECOMES DROUGHT RESISTANT ONCE ESTABLISHED; SOMETIMES NEEDS TIP PRUNING WHEN YOUNG TO DEVELOPE MORE FULLNESS; CHLOROSIS MAY BE A PROBLEM;
	**TRISTANIA LAURINA 'ELEGANS'** TRISTANIA 'ELEGANT'	●					●				●		●			●				●	●		●			●			●	●		●			●				●							GOOD FOR NARROW SIDEWALKS TOLERATES DRAINAGE MOIST SOILS 'ELEGANT' HAS BROADER LEAVES & REDDISH NEW GROWTH;
	**ACER RUBRUM 'OCTOBER GLORY'** RED MAPLE 'OCTOBER GLORY'		●					●				●	●			● ●				●					●		●	●									●	●		●				● 7		MAIN SPECIES MODERATE GROWTH RATE; DEVELOPS UPRIGHT TO OVAL SYMMETRICAL FORM; BRILLIANT RED FALL COLOR IN FROSTY AREAS; SMALL FLOWERS & ATTRACTIVE WINGED SEEDS; TWIGS HAVE NO ODER, LIKE OTHER MAPLES; DESIRABLE STREET OR SHADE TREE, BEST WITH MODERATE WATER IN WELL-DRAINED SOILS; EFFECTIVE GROUPED IN LAWNS, AS A FOREGROUND TO AN EVERGREEN BACKDROP, OR IN SMALL GROAVES IN PARK SETTINGS; EST LIFESPAN 250 YRS OR MORE; 'OCTOBER GLORY' - STAY GREEN LONGER THAN USUAL IN AUTUMN, EXTENDING SEASONAL DISPLAY, GIVING DEPENDABLE LATE SEASON CRIMSON-RED FALL COLOR; TREE ROUNDED, NOT DENSE; FEMALE
	**ACER RUBRUM 'RED SUNSET'** RED MAPLE 'RED SUNSET'		●					●				●		●	●								●			●	●										●	●		●						'RED SUNSET' - MOST COMMONLY PLANTED RED MAPLE; FALL COLOR IN NORHT IS LONG LASTING & SUPERB ORANGE-RED; FEMALE

		EVERGREEN	DECIDUOUS	CONIFEROUS	PALM	UP TO 15'	15' – 30'	30' – 50'	OVER 50'	20' OR LESS	20' – 30'	30' +	ROUND	SPREADING	COLUMNAR	OVAL	UPRIGHT	PYRAMIDAL	OPEN	MEDIUM	DENSE	FINE	MED	COARSE	20' – 30'	30' – 40'	40' +	SUN	SUN-SHADE	SHADE	DROUGHT	WIND?	OAK ROOT FUNGUS	20-40 YRS	OVER 40 YEAS	AROMATIC	ATTRACTS BIRDS	FRUIT/ FLOWER	FALL COLOR	UNUSUAL LEAVES	2' TO 4'	4' TO 6'	OVER 6'	RETROFIT COMM 2 LANE	RETROFIT COMM 1 LANE	REDIDENTIAL	NEW COMMERCIAL	
	SCIENTIFIC NAME COMMON NAME 'CULTIVATED VARIETY'	**TYPE**				**HEIGHT**				**CROWN SPREAD**			**SHAPE**						**FOLIAGE DENSITY**			**TEXTURE**			**SPACING**			**EXPOSURE**			**TOLERANCE**			**LIFE OF TREE**		**OUTSTANDING CHARACTERISTICS**						**PARKWAY STRIPS**			**EXISTING LOCATIONS**				**COMMENTS**
	**TRISTANIA LAURINA** TRISTANIA 'LAURINA'	●					●				●		●			●									●			●									●						● 1				SLOW GROWTH RATE; DENSE, ROUNDED, UPRIGHT FORM; CLUSTERS OF SMALL FLOWERS AROMATIC WHEN CRUSHED; SMALL SEEDS; ATTRACTIVE SMALL EVERGREEN ACCENT TREE, USEFUAL AS A STANDARD WITH STAKING & PRUNING; TOLERATES INLAND HEAT & MODERATE DRYNESS IN SEMI-SHADE, BUT BECOMES LEGGY IN FULL SHADE; BEST IN FULL SUN NEAR THE COAST; EST LIFESPAN 80-100 YRS
	**ULMUS HYBRID 'FRONTIER'** FRONTIER ELM		●				●			●								●							●																●						INFO FROM U.S. NATIONAL ARBORETUM: RELEASED IN 1990; HYBRID ELM OF MODERATE STATURE AND ATTRACTIVE RED FALL COLOR; COMBINES A HIGH TOLERANCE LEVEL TO DUTCH ELM DISEASE, MODERATE RESISTANCE TO ELM LEAF BEETLE, SMALL LEAVES, & AN RED-PURPLE AUTUMN COLORATION; GOOD FOR USE IN SMALLER LANDSCAPES, ALONG CITY STREETS, & UNDER POWER LINES; SMALL TO INTERMEDIATE SIZE TREE; HIGHLY TOLERANT TO NATURAL INFECTIONS OF ELM YELLOWS; RARELY FLOWERS, SO NO SEED PRODUCTION OBSERVED; TOLERANT IN URBAN LOCATIONS; AVOID PLANTING CLOSE TO BUILDINGS IN AREAS WITH HIGH LEAF BEETLE POPULATIONS; SLOWER GROWING IN SOD CULTURE;
	**ARBUTUS 'MARINA'** ARBUTUS 'MARINA'	●						●				●	●				●	●			●			●		●		●	●	●	●		●			●		●					●					SHOWY FLOWERS MAIN SPECIES HAS COMFLICTING INFORMATION; 'MARINA' - HYBRID; PINK FLOWERS; NOT AS TALL AS MAIN SPECIES WITH EQUAL SPREAD; TOLERATES DROUGHT ONCE ESTABLISHED; PREFERS WELL DRAINED SOILS; FRUITS 1 INCH WIDE AND VERY ABUNDANT
	**GINKGO BILOBA 'AUTUMN GOLD'** GINKGO 'AUTUMN GOLD'		●					●				●	●				●	●	●				●			●		●	●	●		●		●				●	●				●					SMOG TOLERANT 'AUTUMN GOLD' - FIRST CULTIVAR OF SPECIES DISTRIBUTED IN CA; MALE (NO FRUIT); COMMON; OVAL UPRIGHT CROWN;
	**PLATANUS ACERIFOLIA 'COLUMBIA'** LONDON PLANE 'COLUMBIA'		●						●			●		●						●				●			●	●	●	●			●					●	●				● 14	● 40	● 3		MAIN SPECIES GROWS FAST, DEVELOPING BROAD, SYMMETRICAL, CONICAL TO OVAL FORM; PODS HANG IN CLUMPS OF 2-3 ON STRING; CLASSIC SHADE TREE FOR ST, PARK OR LARGE TREE WELLS; SOMETIMES POLLARDED FOR URBAN USE; ANTHRACNOSE (AIRBORNE DISEASE) CAUSES TEMPORARY LEAF DROP & DISFIGURATION; TOLERATES HEAT, DUST, & SMOG; NEEDS AMPLE ROOM; SHALLOW WATERING PRODUCES LARGER SURFACE ROOTS, WHICH CAN HEAVE PAVING; LIFESPAN EST 150-300 YRS; 'COLUMBIA' HAVE GOOD MILDEW RESISTANCE IN COASTAL CLIMATES; RESISTS ANTHRACNOSE ON EAST COAST, BUT NOT THE WEST COAST;

		TYPE				HEIGHT				CROWN SPREAD			SHAPE						FOLIAGE DENSITY			TEXTURE			SPACING			EXPOSURE			TOLERANCE			LIFE OF TREE		OUTSTANDING CHARACTERISTICS				PARKWAY STRIPS			EXISTING LOCATIONS				
	SCIENTIFIC NAME COMMON NAME 'CULTIVATED VARIETY'	EVERGREEN	DECIDUOUS	CONIFEROUS	PALM	UP TO 15'	15' – 30'	30' – 50'	OVER 50'	20' OR LESS	20' – 30'	30' +	ROUND	SPREADING	COLUMNAR	OVAL	UPRIGHT	PYRAMIDAL	OPEN	MEDIUM	DENSE	FINE	MED	COARSE	20' – 30'	30' – 40'	40' +	SUN	SUN-SHADE	SHADE	DROUGHT	WIND?	OAK ROOT FUNGUS	20-40 YRS	OVER 40 YEAS	AROMATIC	ATTRACTS BIRDS	FRUTI FLOWER	FALL COLOR	UNUSUAL LEAVES	2' TO 4'	4' TO 6'	OVER 6'	RETROFIT COMM 2 LANE	RETROFIT COMM 1 LANE	REDIDENTIAL	NEW COMMERCIAL	COMMENTS
	**QUERCUS ILEX** HOLLY OAK	●						●				●	●					●			●		●			●			●			●			●					●							ACORNS MODERATE GROWTH RATE; DEVELOPS DENSE, OVAL, ROUND-TOPPED FORM FROM A HEAVY TRUNK WITH THEICK ASCENDING LIMBS & TWIGGY ENDS; TINY FLOWERS; ACORNS MATURE IN LATE SUMMER; ATTRACTIVE, DEEPLY ROOTED EVERYGREEN LAWN, PARK OR ST TREE; TOLERATES WIND & COASTAL CONDITIONS AS WELL AS HEAT INLAND, WHERE IT DOES BEST WITH MODERATE MOISTURE, OFTEN IN LAWNS; GROWTH IS STUNTED IN DROUGHT; TOLERATES CLIPPING INTO HEDGES OR OTHER FORMS; EST LIFESPAN 100-200 YRS
	**QUERCUS RUBRA** RED OAK		●						●			●	●	●				●			●			●			●	●		●				●				●			●					NEEDS AMPLE WATER MODERATE GROWTH RATE; BROAD OVAL CANOPY & A SYMMETRICALLY ROUNDED SHAPE WITH BRANCHES ASCENDING FROM A LARGE CENTRAL TRUNK; DEEP ORANGE RED BROWN COLOR; TINY FLOWERS; ACORNS MATURE IN FALL; DESIRABLE LARGE-SCALE OAK WITH CONSISTENT UPRIGHT BRANCHING COMMONLY USED FOR ST, PARK, OR LAWN SHADE TREE; DEEP ROOTES WITH HEAVY SUBSURFACE LATERAL ROOTS, WHICH REQUIRE ROOM TO SPREAD; REQUIRES DEEP WATERING & WELL DRAINED SOIL TO BECOME ESTABLISHED; INITIAL GROWTH SLOW FOR ABOUT 10 YRS; EST LIFESPAN 500 YRS OR MORE;
	**ZELKOVA SERRATA 'VILLAGE GREEN'** SAWLEAF ZELKOVA 'VILLAGE GREEN'		●						●			●	●	●						●			●		●		●							●				●			●			● 1		MAIN SPECIES MODERATE TO FAST GROWTH RATE; FROMS A BROAD, ARCHING CANOPY WITH STRONG FRAMEWORK OF MULTIPLE BRANCHES FROM A LARGE, SHORT TRUNK; TINY FLOWERS; SMALL FRUITS; EXCELLENT LARGE ST OR PARK TREE; GENERALLY PREFERS CLIMATES WITH SEASONAL CHANGE & COLDER WINTERS; DEEP-ROOTED, BUT REQUIRES ADEQUATE ROOM FOR IT'S CANOPY & LARGE ROOTS; TOLERATES WIND & HEAT; FAIRLY PEST RESISTANT, EXCEPT FOR OCCASIONAL RED SPIDER MITES & BLACK SCALE; CLOSELY RELATED TO ELMS. & THO RESISTANT TO DUTCH ELM DISEASE, CAN BE CONSIDERED A CARRIER; EST LIFESPAN 200-300 YRS; 'VILLAGE GREEN' - COMMON; ROUNDED CROWN; FALL COLOR RUSTY-RED; HARDIER THAN OTHER CULTIVARS;

APPENDIX B

http://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/SOSIP/AppendixB.pdf