VIII. PEDESTRIAN DESIGN GUIDE

Good pedestrian design encourages walking

Although the *Pedestrian Design Guide* is Chapter VIII of the Pedestrian Master Plan, it is also intended to be printed separately and distributed under its own cover to planners, engineers, and architects involved in the design of Santa Barbara's pedestrian space. Typically, pedestrian facilities are designed and constructed as a part of another type of project, such as land development, intersection, and road improvements. In the past, projects designed for the car or for the purposes of private development may have hindered or become barriers to pedestrian use because the pedestrian aspects of projects were often secondary or overlooked altogether. For example, some new developments were built without sidewalks, and some sidewalks have been placed directly next to the curb. The guidelines for pedestrian design are in some ways intended to reverse this trend. To be successful, however, designers must view preservation and enhancement of the pedestrian environment as a primary goal of any project.

Goal 4 of the Pedestrian Master Plan reads: Establish pedestrian design guidelines that will result in pedestrian environments that are attractive, functional, and accessible to all people.

The design of the pedestrian environment will directly affect the degree to which people enjoy the walking experience. If designed appropriately, the walking environment will not only serve the people who currently walk, but also be inviting for those who may consider walking in the future. Therefore, when considering the appropriate design of a certain location, designers should not just consider existing pedestrian use, but how the design will influence and increase walking in the future. Additionally, designers must consider the various levels of walking abilities and local, state, and federal accessibility requirements. Although these types of requirements were specifically developed for people with walking challenges, their use will result in pedestrian facilities that benefit all people.

Policy 4.1 The City shall establish and maintain pedestrian design guidelines

Developing the Guidelines

The *Pedestrian Design Guide* was developed through a consensus-building process involving participation by each of the programs and agencies responsible for the form and function of the right-of-way.

Special thanks to the Portland (Oregon) *Pedestrian Design Guide*, from which this document uses significant portions of the text and many graphics.

Throughout, the guidelines attempt to balance pedestrian needs with the design needs and constraints of each of the other uses of the right-of-way. In a few cases, this balance resulted in guidelines that maintain the quality of the overall system but may be less than the ideal for pedestrians.

Regulations and Controls

In many cases, the practices that are covered by these guidelines are also the subject of other regulations or codes. This document attempts to knit together these disparate requirements.

The Municipal Code, which includes the zoning ordinance, the traffic code, and the public improvements code, contains language regulating some elements. State laws and rules regulate others. Some Standard Construction Details, issued by the City Engineer for Santa Barbara, apply to the pedestrian realm. References to the appropriate code language or specification are included where possible. Notes have been included where appropriate to suggest where new code language would be recommended.

Finally, there are numerous guidelines issued by various national organizations that constitute the canon of standard engineering practice. These include the Manual on Uniform Traffic Control Devices (MUTCD) and the Americans with Disabilities Act Access Board (ADAAG) Guidelines.

Other Design Guidelines

The City of Santa Barbara Urban Design Guidelines: City Grid and the El Pueblo Viejo Design Guidelines should also be referenced when developing in these respective areas. The Pedestrian Design Guide is intended to supplement these documents.

Implementing the Guidelines

The *Santa Barbara Pedestrian Design Guide* is issued by the City Transportation Engineer. Every project that is designed and built in the City of Santa Barbara should conform to these guidelines.

Site conditions and circumstances often make applying a specific solution difficult. The *Pedestrian Design Guide* should reduce the need for ad hoc decisions by providing a published set of guidelines that are applicable to most situations. Throughout the guidelines, however, care has been taken to provide flexibility to the designer so that she or he can tailor the standards to unique circumstances. Even when the specific guideline cannot be met, the designer should attempt to find the solution that best meets the pedestrian design principles described on page 201. Additional guidance is available in the City of Santa Barbara's Urban Design Guidelines: City Grid (1999).

Good pedestrian design is also crucial in private property. An upcoming document, *Access and Parking Design Guidelines*, will guide such private development. In addition, Chapter X provides suggested ordinance language to support private property pedestrian design.

Principles for Pedestrian Design (Strategy 4.1.1)

The following design principles represent a set of ideals which should be incorporated, to some degree, into every pedestrian improvement. They are ordered roughly in terms of relative importance.

The pedestrian environment should provide good places.

1. **The pedestrian environment should be safe.**
   Sidewalks, walkways, and crossings should be designed and built to be free of hazards and to minimize conflicts with external factors such as noise, vehicular traffic, and protruding architectural elements.

2. **The pedestrian network should be accessible to all.**
   Sidewalks, walkways, and crosswalks should ensure the mobility of all users by accommodating the needs of people regardless of age or ability.

3. **The pedestrian network should connect to places people want to go.**
   The pedestrian network should provide continuous direct routes and convenient connections between destinations, including homes, schools, shopping areas, public services, recreational opportunities, and transit.

4. **The pedestrian environment should be easy to use.**
   Sidewalks, walkways, and crossings should be designed so people can easily find a direct route to a destination and delays are minimized.

5. **The pedestrian environment should provide good places**.
   Good design should enhance the look and feel of the pedestrian environment. The pedestrian environment includes open spaces such as plazas, courtyards, and squares, as well as the building facades that give shape to the space of the street. Amenities such as seating, street furniture, banners, art, plantings, shading, and special paving, along with historical elements and cultural references, should promote a sense of place.

6. **The pedestrian environment should be used for many things.**
   The pedestrian environment should be a place where public activities are encouraged. Commercial activities such as dining, vending, and advertising may be permitted when they do not interfere with safety and accessibility.

7. **Pedestrian improvements should preserve or enhance the historical qualities of a place and the City.**
   Santa Barbara's history must be preserved in the public space. Where applicable, pedestrian improvements should restore and accentuate historical elements of the public right-of-way. Good design will create a sense of time that underscores the history of Santa Barbara.

8. **Pedestrian improvements should be economical.**
   Pedestrian improvements should be designed to achieve the maximum benefit for their cost, including initial cost and maintenance cost as well as reduced reliance on more expensive modes of transportation. Where possible, improvements in the right-of-way should stimulate, reinforce, and connect with adjacent private improvements.

Guidelines for Sidewalk Corridors (Strategy 4.1.2)

The Sidewalk Corridor is the portion of the pedestrian system from the edge of the roadway to the edge of the right-of-way, generally along the sides of streets, between street corners.[2] The Sidewalk Corridor functions to provide an environment for walking that is separated from vehicle movement.[3]

Attributes of Good Sidewalk Corridors

Accessibility — The Sidewalk Corridor should be easily accessible to all users, whatever their level of ability.

Adequate Travel Width — In most areas, two people walking together should be able to pass a third person comfortably, and different walking speeds should be possible. In areas of intense pedestrian use, sidewalks should be wider to accommodate the greater volume of walkers.

Safety — Sidewalk Corridors should allow pedestrians to feel a sense of safety and predictability. Sidewalk users should not feel threatened by adjacent traffic.

Continuity — The walking route along a Sidewalk Corridor should be obvious and should not require pedestrians to travel out of their way unnecessarily.

Landscaping — Plantings and street trees in the Sidewalk Corridor should create desirable microclimates and should contribute to the psychological and visual comfort of sidewalk users.

Social Space — Sidewalk Corridors should provide places for people to interact. There should be places for standing, visiting, and sitting. The Sidewalk Corridor should be a place where children can safely participate in public life.

Quality of Place — Sidewalk Corridors should contribute to the character of neighborhoods and business districts, and strengthen their identity.

[2] City of Santa Barbara Municipal Code 22.60.110 defined for business, 22.60,120 defined for residential
[3] Recommend adding to Municipal Code. See City of Portland Title 16, Vehicles and Traffic 16.90.330

Required Sidewalk Improvements

Construction of New Streets in New Rights-of-Way

All construction of new public streets will include sidewalk improvements on both sides.

Exception:

For new streets, provision of a sidewalk improvement on only one side will be considered under the following conditions:

- right-of-way has severe topographic or natural resource constraints; or
- street is a cul-de-sac with four or fewer dwelling units.

Street Improvements to Existing Rights-of-Way

All improvements to existing streets will include sidewalk construction. Street improvements will be provided with sidewalk improvements on both sides of all streets in High Pedestrian Use areas. High Pedestrian Use areas are areas within ¼ to ½ mile of land uses such as commercial, hotel, public facilities, and ocean-front areas that attract high volumes of pedestrian activity. Downtown Santa Barbara is a High Pedestrian Use area, while other areas would include connections to beachfronts and commercial centers such as La Cumbre Plaza. The following list contains zoning classifications that foster a High Pedestrian Use environment. These include but are not limited to:

- Commercial
- Harbor commercial
- Hotel/motel uses
- High density residential located within walking proximity to Downtown (within city grid)
- Public facilities located within walking proximity to Downtown (within city grid)
- Public recreation areas (active-use) within walking proximity to Downtown

Table VIII-2 on page 218 details the sidewalk guidelines for High Pedestrian Use areas.

Though the following guidelines focus on the public spaces in these popular pedestrian areas, many of the following guidelines can be used in areas with less pedestrian traffic, such as residential neighborhoods and areas outside of Santa Barbara's commercial/retail core that have a lower intensity of pedestrian use. These areas are referred to as Low Pedestrian Use areas and include a combination of streets with and without sidewalks. Table VIII-3 on page **Error! Bookmark not defined.** details the sidewalk guidelines for Low Pedestrian Use Areas.

When the existing right-of-way is too narrow to accommodate both street and sidewalk improvements, pursue the following steps to allow room for a sidewalk improvement:

- acquire additional right-of-way or public walkway easement
- narrow existing roadway in accord with established minimum roadway standards

Exceptions:

For improvements to existing street rights-of-way in High Pedestrian Use areas and on city walkways, approval for a sidewalk on only one side will be considered under the following conditions:

- right-of-way has severe topographic or natural resource constraints

For improvements to existing street rights-of-way in Low Pedestrian Use areas, approval for a sidewalk on only one side only will be considered under the following conditions:

- right-of-way has topographic or natural resource constraints; or
- right-of-way has existing development or mature landscaping constraints; or
- street is a cul-de-sac with fewer than 20 dwelling units.

For improvements to existing street rights-of-way in Low Pedestrian Use areas, approval for providing no sidewalk will be considered under the following condition:

- right-of-way has very severe topographic or natural resource constraints

Frontage Improvements on Existing Streets

Sidewalk improvements will be required as part of all new infill building development on existing streets, to the extent practicable.

Where the existing road has no curb or is otherwise substandard and it is not practicable to construct full street improvements for a limited street segment, the City Engineer may require an interim path to be constructed.

Exceptions:

A waiver of remonstrance (a document stating that a property is already counted in favor of a street improvement), covenant, or other legal agreement may be accepted in lieu of immediate sidewalk construction under the following conditions:

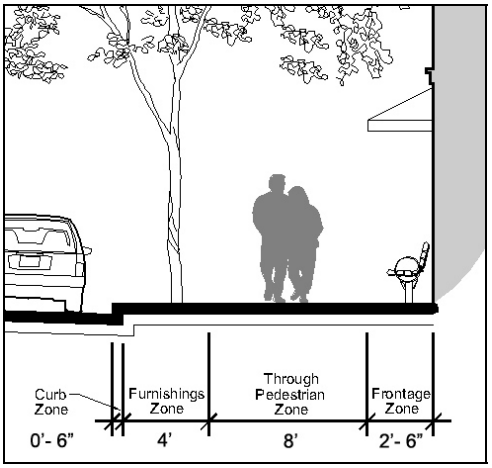
- the existing road has no curb or is otherwise substandard and it is not practicable to construct full street improvements or an interim path for a limited street segment; or
- infill development of single-family residential use is proposed for three or fewer contiguous lots where the majority of lots on the block have already been developed and there is no pattern of existing sidewalk improvements in the area.

If a waiver is granted, the developer must pay an in lieu fee into the Sidewalk Infill Program in the amount equivalent to the linear foot cost of the City constructing the same length of sidewalk in a similar location.

Designing and Implementing Sidewalk Corridor Improvements

Zones in the Sidewalk Corridor

Sidewalks are the most important component of Santa Barbara's pedestrian circulation network. Sidewalks provide pedestrian access to virtually every activity and provide critical connections between other modes of travel, including the automobile, public transit, and bicycles. The Sidewalk Corridor is typically located within the public right-of-way between the curb or roadway edge and the property line. The Sidewalk Corridor contains four distinct zones: the ***Curb Zone***, the ***Furnishings Zone***, the ***Through Pedestrian Zone***, and the ***Frontage Zone***.



Each of these four zones is discussed in detail in the sections that follow. Table VIII-2 and Table VIII-3 on pages 218-**Error! Bookmark not defined.** provide guidelines for recommended widths of these zones under various street conditions.

CONSTRAINTS IN THE SIDEWALK CORRIDOR

Most of Santa Barbara's street system has already been built, and in many cases the existing Sidewalk Corridor is too narrow to accommodate the recommended zone widths. Competing needs for space in a constrained Sidewalk Corridor can be resolved in either of two ways: by compromising on the minimum required clearance for some or all of the zones or by increasing the dimensions of the Sidewalk Corridor.

The resolution of such conflicts in any given case must be based on considerations of balancing the conflicting uses and adjusting the magnitude of the solution to fit the magnitude of the project.

Table VIII-2 on page 218 shows two constrained Sidewalk Corridor conditions that are commonly encountered on existing streets and gives the recommended zone widths for these conditions.

WIDENING THE SIDEWALK CORRIDOR

In some cases, it is possible to increase the dimensions of the Sidewalk Corridor, either through acquisition of right-of-way or public walkway easements, or by reallocation of the overall right-of-way (such as by narrowing travel lanes or reducing the number of lanes). As part of a roadway reconstruction project on a street with a narrow Sidewalk Corridor, the project planners should first analyze the impact of reclaiming a portion of the existing right-of-way. If this proves impractical, the feasibility of acquiring additional right-of-way should be examined. Acquisition should be considered where its cost is reasonable in proportion to the overall project cost.

In the case of infill development, the dedication of public right-of-way or the granting of a public walkway easement to widen the Sidewalk Corridor may be included as a requirement for obtaining a building permit or land use approval.

UNIMPROVED SIDEWALKS

It is the City's intent that there should always be a place for pedestrians to walk, even in areas where fully standard sidewalks are not in place or will likely not be added. For example, the cost of a sidewalk on a steep slope may be prohibitive. In these cases, the City should still strive to provide a firm, stable, and slip resistant area to walk.

VEHICLE PARKING IN THE SIDEWALK CORRIDOR

Parking of motor vehicles is not permitted within the Sidewalk Corridor.[4] Bicycle parking is permitted only where it does not impede pedestrian uses[5] or cause damage to any sidewalk fixtures.[6]

PLANTING IN THE SIDEWALK CORRIDOR

Street trees are a highly desirable part of the pedestrian environment, especially large-canopied shade trees. Every effort should be made to provide enough room in the Sidewalk Corridor to accommodate trees in addition to pedestrian travel. Street trees are required according to the Master Street Tree Plan, Chapter 15.20.030. The minimum clearance over a public street is 13ft 6 inches (4.1 m).

Tree limbs and branches should be trimmed to leave 7 ft 6 in (2.3 m)[7] clear above the level of the sidewalk. Permanent planters usually are not permitted in the right-of-way. Moveable planters are permitted in the Frontage Zone under a permit from the City Engineer, and are limited to a projection of 1 ft 6 in (450 mm) into the right-of-way.[8]

Maintenance of plantings in the Sidewalk Corridor, with the exception of trees planted in public areas, parking strips, and tree wells, is the responsibility of the adjacent property owner.[9]

The Curb Zone

Curbs prevent water in the street gutters from entering the pedestrian space, discourage vehicles from driving over the pedestrian area, and make it easy to sweep the streets. In addition, the curb helps to define the pedestrian environment within the streetscape, although other designs can be effective for this purpose. At the corner, the curb is an important tactile element for pedestrians who are finding their way with the use of a cane.

Unless specified otherwise for a special district, the curb should be 6 in (150 mm) in width, 6 in (150 mm) in height in residential areas, and 7 in (175 mm) in height for commercial areas.[10] In order to prevent vehicular movement onto the sidewalk area, it is recommended that the curb height be no less than 4 in (100 mm) following routine asphalt overlays of the street. An exception to this

[4] California Vehicle Code (CVC) 22500(f)
[5] CVC 21210
[6] Code 9.68.010
[7] Recommend adding height to Code. See City of Portland Title 17, Section 17.52.010
[8] Recommend adding moveable planter Code. See City of Portland Title 17.52.050
[9] Municipal Code 15.20.090
[10] Recommend adding curb dimensions to Code. See Portland Standard Plan Nos. 3-130, 3-131, 3-132

recommendation is at corners, where the landing height may be reduced in order to accommodate curb ramps (see "Recommended Landing Height at Corners" on page 231).

The Curb Zone defines the pedestrian area, providing a buffer between the sidewalk and street. The Zone usually consists of the width of the curb and may contain space for unloading passengers or freight.

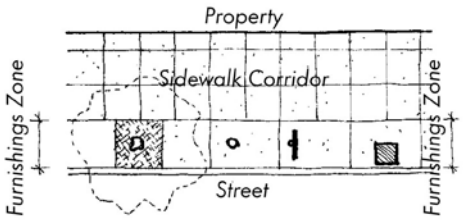
- Curb Zone width should be 18 inches where pedestrian or freight loading is expected and may conflict with obstacles, such as planters, in the Furnishings Zone.
- Curb Zone width along all other streets should be a minimum of six inches.

Table VIII-2 on page 218 lists the applications and provides recommended configurations for High Pedestrian Use areas.

The Furnishings Zone buffers pedestrians from the roadway and is the place for elements such as street trees, poles, parking meters, and street furniture.

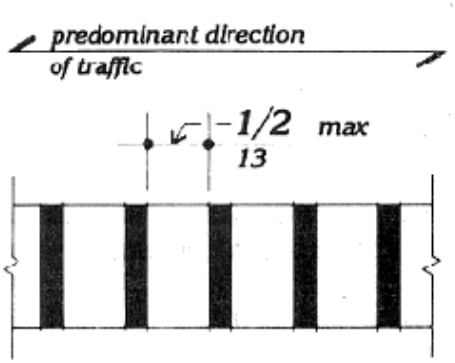
The Furnishings Zone

The Furnishings Zone buffers pedestrians from the adjacent roadway, and is also the area where elements such as street trees, signal poles, utility poles, street lights, controller boxes, hydrants, signs, parking meters, driveway aprons, grates, hatch covers, and street furniture are properly located. This is the area where people alight from parked cars.



Typical alignment of the Furnishings Zone within the Sidewalk Corridor

Wherever it is wide enough, the Furnishings Zone should include street trees. In commercial areas, this zone may be paved, with tree wells and planting pockets for trees, flowers, and shrubs. In other areas, this zone generally is not paved except for access walkways, but is landscaped with some combination of street trees, shrubs, ground cover, lawn, or other landscaping treatments.



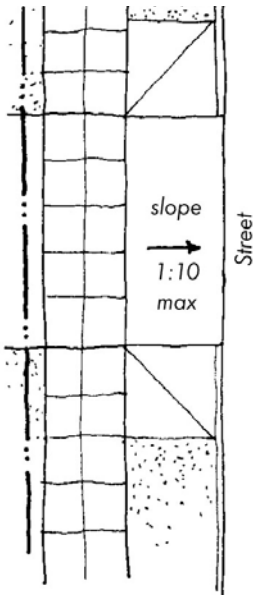
Ventilation grates should have openings of ½ inch max.

Separating pedestrians from travel lanes greatly increases their comfort as they use the Sidewalk Corridor. This buffer function of the Furnishings Zone is especially important on streets where traffic is heavy, yet along many of these streets the existing Sidewalk Corridor is narrow. Where possible, additional width should be given to this zone on streets with traffic speeds over 35 mph (55 km/h).

The Furnishings Zone lies between the Through Pedestrian Zone and Curb Zone. All fixtures and street furniture should be contained in the Furnishings Zone to keep the Through Pedestrian Zone free for walking. Items placed within the Furnishings Zone may include:

- Bus shelters
- Trees, planters & landscaping
- Trash & recycling receptacles
- Bicycle racks
- Street lights
- Clocks
- Public art
- Banners & flags
- Information kiosks
- Wayfinding/signage
- Benches
- Consolidated news racks
- Fountains

Benches and other street furnishings serve an aesthetic and utilitarian purpose.



Preferred driveway condition

Street furnishings can enliven and provide variety to outdoor public spaces. They serve an aesthetic as well as utilitarian function. Proper design and placement of street furnishings will reinforce the Downtown design theme throughout Santa Barbara. The amount and types of furnishings provided will vary depending on the uses along the street and amount of pedestrian activity. When placing furnishings in the El Pueblo Viejo District, the El Pueblo Viejo Guidelines for furnishings must be followed.

- On sidewalks of ten feet or greater, the Furnishings Zone width should be a minimum of four feet. A wider zone should be provided in areas with large planters and/or seating areas, like those on lower State Street.
- Street furnishing should create a unified look. The color and appearance of street furnishings should be selected in concert with other design elements (such as special paving), surrounding furnishings, and the area as a whole.
- Street furnishings should be securely anchored to the sidewalk and protected with a graffiti-resistant coating to ensure a long-term quality appearance.
- The design and selection of street furniture should include consideration for the security, safety, comfort, and convenience of the user.
- Street furniture should be grouped together to conserve sidewalk space, provide complementary functions, and maintain a clear width sufficient to accommodate pedestrian flow. A greater number and type of furnishings should be located in high-use pedestrian traffic areas.
- The design and siting of furnishings should accommodate the physically challenged. This includes provision of space adjacent to walkways for wheelchairs and/or strollers.
- Textured paving may be used in the Furnishings Zone for decorative purposes.

- To reduce street clutter, consolidate signage on light poles, and other permanent fixtures, wherever possible.
- Provide pedestrian-scale lighting that complements the surrounding built and natural environment. When determining the proper level of illumination for a pedestrian area, it is important to consider the quality of light versus the quantity of light. The lighting should be subtle and avoid overlighting while being bright enough to provide a sense of security. Consider a variety of lighting types, including footlighting, indirect lighting (wall washing), and overhead lamps. All lighting fixtures shall conform to the City's Outdoor Lighting Design Guidelines.[11]

GRATES

All grates within the sidewalk shall be flush with the level of the surrounding sidewalk surface, and shall be located outside the Through Pedestrian Zone. Ventilation grates and tree well grates shall have openings no greater than 1/2 in (13 mm) in width.[12]

Designers should use tree well grates or treatments such as unit pavers in High Pedestrian Use areas.

HATCH COVERS

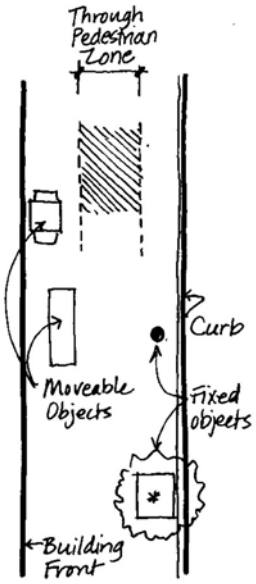
Hatch covers should be located within the Furnishings Zone.[13] Hatch covers must have a surface texture that is rough, with a slightly raised pattern. The surface should be slip-resistant even when wet. The cover should be flush with the surrounding sidewalk surface.

The Through Pedestrian Zone

The Through Pedestrian Zone is the area intended for pedestrian travel. This zone should be entirely free of permanent and temporary objects.

As a general rule, the zone should be at least 8 ft (2.4 m) in Pedestrian Districts, at least 6 ft (1.8 m) on City Walkways, and at least 5 ft (1.5 m) on Local Service Walkways (see Table VIII-2 and Table VIII-3 for specific recommendations). For very high volume pedestrian areas, additional width should be provided.

The Through Pedestrian Zone is the area of the Sidewalk Corridor intended for pedestrian travel.



Typical alignment of the Through Pedestrian Zone within the Sidewalk Corridor.

[11] City of Santa Barbara Urban Design Guidelines: City Grid, 1999, p.48.
[12] Americans with Disabilities Act 4.5.4, APWA 519-3
[13] Standard Details 3-004; 6-006 through 6-008

For sidewalk infill projects in areas with some existing sidewalks, the new sidewalk should match the existing width or meet the recommended width in Table VIII-2 or Table VIII-3, whichever is larger.

The Through Pedestrian Zone serves as the sidewalk area dedicated to walking and is located between the Frontage Zone and Furnishings Zone.

- This Zone should be kept clear of any fixtures and/or obstructions. A minimum of five feet should be reserved to allow for two people to walk comfortably side by side. See Table VIII-2 for dimensions.
- Clearance should be provided in a generally straight path for the convenience of all pedestrians, but especially for the sight-impaired.
- Sidewalk surface must be stable, firm, smooth, and slip-resistant, per the ADA.

Driveway aprons should not intrude into the Through Pedestrian Zone. See "Driveways" on page 215.

SURFACES

Walking surfaces shall be firm and stable, resistant to slipping, and allow for ease of passage by people using canes, wheelchairs, or other devices to assist mobility.

Sidewalks are generally constructed of Portland cement concrete.[14] Brick or concrete unit pavers may also be used, at the discretion of the City Engineer, particularly in the Furnishings Zone or around mature trees where sidewalk lifting is a problem.

For a discussion of these and other materials, see Table VIII-1. As other products become environmentally available, are tested, and prove effective, they should be added to this table.

The surface of concrete sidewalks should be scored to match historic patterns within a neighborhood or district where appropriate, at the discretion of the Historic Landmarks Commission.

Table VIII-1. Materials

Concrete	
Where to Use	Preferred material for use on sidewalks or on alternative pathways separated from the road by a curb and/or planting strip or swale. Not for use as a material for widened shoulder alternative pathways.
Construction Technique	4 in (100 mm) of 3300 psi (23 MPa) Portland cement concrete on compacted subgrade; 4 in (100 mm) of compacted aggregate can also be used as a base where needed.
Property Owner Maintenance	Relatively easy to maintain, either by property owner or by hired contractor.
Maintenance Life	75 years plus
Comparative Cost (2005)	$29.25/sq yd ($35.00/sq m)
20 Year Cost	$7.80/sq yd ($9.33/sq m)

[14] per Code 22.60.100: "No material other than Portland cement concrete shall be used for the permanent construction of sidewalks, driveways, curbs, or curb and gutters in or adjacent to any street, alley, court or public place within the City."

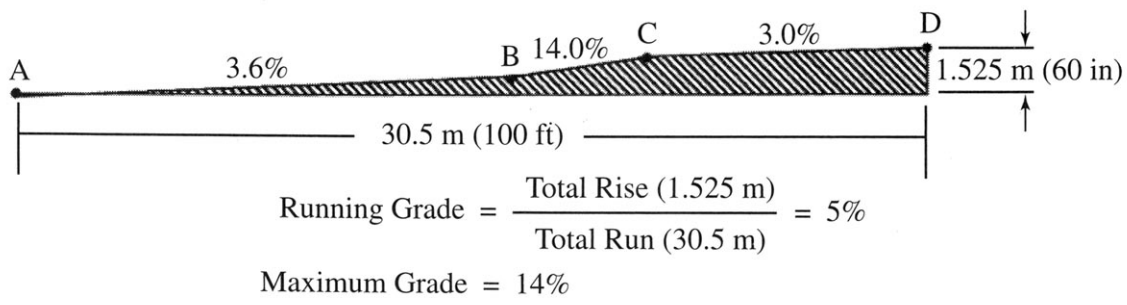
Asphalt	
Where to Use	Preferred material for use on any widened shoulder alternative pathway. Acceptable but not preferred as a material for separated alternative pathways or connector paths. Unacceptable for use for City standard sidewalk.
Construction Technique	4 in (100 mm) of asphalt concrete in two 2 in (50 mm) lifts on 4 in (100 mm) of compacted aggregate base.
Property Owner Maintenance	The City will be responsible for maintaining widened shoulders. For separated pathways, asphalt is fairly difficult to maintain for a property owner since hot mix asphalt is required for patching.
Maintenance Life	40 years plus
Comparative Cost (2005)	$25.00/sq yd ($30.00/sq m)
20 Year Cost	$12.50/sq yd ($15.00/sq m)
Concrete Pavers	
Where to Use	Acceptable material for use on sidewalks, at the discretion of the City Engineer, in the Furnishings Zone, and on alternative pathways separated from the roadway by a curb and/or planting strip or swale. Not for use as a material for widened shoulder alternative pathways.
Construction Technique	Concrete unit pavers (varying size) on of sand and 4 in (100 mm) compacted aggregate base; pavers to be placed hand tight and the joints swept with sand. Alternatively, pavers can also be set on a 1 in (25 mm) mortar bed, either hand tight or with mortared joints. Geotextile fabric is recommended between the aggregate base and the sand layer.
Property Owner Maintenance	Relatively easy to maintain, either by property owner or by hired contractor.
Maintenance Life	20 years plus
Comparative Cost (2005)	$50.00/sq yd ($60.00/sq m)
20 Year Cost	$50.00/sq yd ($60.00/sq m)
Crushed Rock	
Where to Use	Acceptable material for use on a connector that is not a continuous passage. Limited use for horizontally separated pathways along roadways with low traffic volumes and no on-street parking. Unacceptable for use as a widened shoulder material or as part of a City standard street improvement.
Construction Technique	2 in (50 mm) of 1/4 in minus (6 mm minus) compacted aggregate over 4 in (100 mm) of 3/4 in minus (19 mm minus) compacted aggregate; geotextile fabric is recommended below the aggregate to limit weed growth. Compact material to create firm, smooth walking surface.
Property Owner Maintenance	Relatively easy to maintain, either by property owner or by hired contractor. Will require continuous ongoing maintenance if the intent is to provide an ADA compliant walking surface.
Maintenance Life	5 years plus
Comparative Cost (2005)	$8.40/sq yd ($10.00/sq m)
20 Year Cost	$33.60/sq yd ($40.00/sq m)
Bark Mulch	
Where to Use	Acceptable material for use on a connector that is not a continuous passage. Unacceptable for use along a vehicular way or as part of a City standard street improvement.

Construction Technique	4 in (100 mm) of bark mulch on compacted subgrade; geotextile fabric beneath the mulch is recommended to limit weed growth. Compact material to create firm, smooth walking surface.
Property Owner Maintenance	Relatively easy to maintain, either by property owner or by hired contractor. Will require continuous ongoing maintenance if the intent is to provide an ADA compliant walking surface.
Maintenance Life	2 years plus
Comparative Cost (2005)	$4.20/sq yd ($5.00/sq m)
20 Year Cost	$42.00/sq yd ($50.00/sq m)
Brick Pavers on Concrete	
Where to Use	Should only be used on sidewalks and not on any multiuse paths due to expense. Can also be used as a pedestrian enhancer in restaurant areas with outside seating or other outdoor uses. Alternatively, concrete can be installed and brick laid on top at a later date.
Construction Technique	Excavate 8-9 in, drop rock down 4 in, compact, then install 3000 psi concrete 4 in, then lay brick.
Property Owner Maintenance	Difficult to maintain since the concrete must be removed and laid back down before the bricks can be reinstalled.
Maintenance Life	25 years
Comparative Cost (2005)	$18.00/sq ft
20 Year Cost	$10,000/mile/year
Brick Pavers on Sand	
Where to Use	Should only be used on sidewalks and not on any multiuse paths due to expense. Can also be used as a pedestrian enhancer in restaurant areas with outside seating or other outdoor uses.
Construction Technique	Lay down 3-4 in of sand, lay the brick on top of the sand, and sweep sand over the brick to fill in spacings between bricks.
Property Owner Maintenance	Relatively easy to maintain, either by property owner or by hired contractor. Bricks can be removed, sand can be smoothed out, and bricks can be replaced.
Maintenance Life	10 years (due to tree root invasion; can install a root barrier to prolong life)
Comparative Cost (2005)	$12.00/sq ft
20 Year Cost	$10,000+/mile/year
Sandstone Curbs	
Where to Use	As a curb, sandstone is highly durable and can be used anywhere.
Construction Technique	A 4-inch layer of granular compacted material should be tamped around fixed structures to a uniform sub-grade. Wooden wedges should be inserted in the curb edges to tighten spacing; these gaps are then filled with mortar.
Property Owner Maintenance	Virtually no maintenance is required for sandstone curbs.
Maintenance Life	Indefinite – only possible long-term wear and tear is discoloration, treatable with a mixture of Clorox and water.
Comparative Cost (2005)	$18.00/ft
20 Year Cost	N/A – maintenance is not required
Rubberized Sidewalks	
Where to Use	Pedestrian only. Avoid heavy loads including equestrians, bicyclists, and vehicles

Construction Technique	Prepare subbase, place geotextile, 6" aggregate base, apply rubberized surface over base.
Property Owner Maintenance	Reapply binding agent every 5-6 years. Keep surface clean, dirt and sand wear surface down. Full replacement needed after 10 years.
Maintenance Life	8-10 years
Comparative Cost (2005)	$12.50/ft

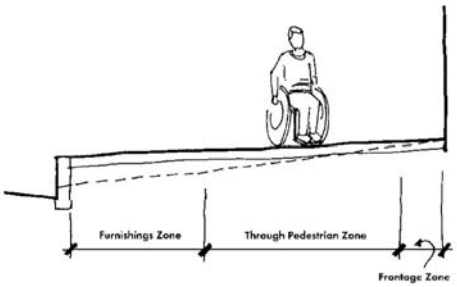
GRADE

The grade of a sidewalk is important because of the issues of control, stability, and endurance. Gentle grades are preferred to steep grades so as to make it possible for people to go up hill, so that they don't lose control on the downhill, and so that they don't lose their footing.

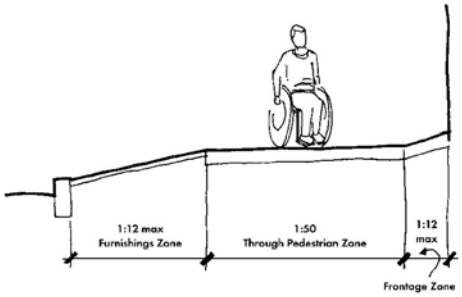


Running Grade and Maximum Grade

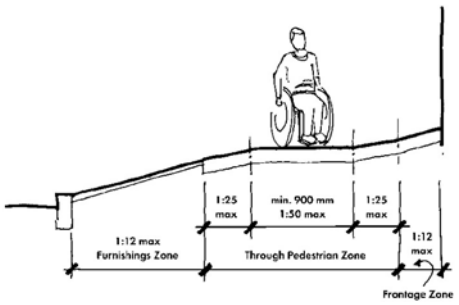
- Grade is the slope parallel to the direction of travel.
- Running grade is the average grade along a continuous path.
- Maximum grade covers a limited section of sidewalk that exceeds the running grade. It is measured over 24 in (0.610 m). The above figure illustrates running grade and maximum grade.
- Rate of change of grade is the change of grade over a distance of 24 in (0.610 m) intervals.
- Counter slope is the grade running opposite to the running grade.
- New sidewalks must be built to comply with these grade requirements. However, in a steep area with existing roadways, exceptions are allowed. Staircases and/or elevators can provide an alternative.



Raising the curb is one approach to maintaining the preferred cross slope.



The Furnishings Zone and the Frontage Zone may be sloped more steeply, provided the preferred cross slope is maintained in the Through Pedestrian Zone.



If necessary, the Through Pedestrian Zone may contain slopes up to 1:25, provided a 900 mm (3'-0") wide area with a cross slope of no more than 1:50 is maintained within the zone.

CROSS SLOPE

Cross-slope affects the stability of wheelchairs, walking aids, and people who have difficulty walking but don't use aids. All sidewalks require some cross-slope for drainage, but cross-slope that is too great presents problems for disabled users. The recommended cross-slope for sidewalks is 2%. The preferred cross slope for the entire paved sidewalk corridor is 1:50. If a greater slope is anticipated because of unusual topographic or existing conditions, the designer should maintain the preferred slope of 1:50 within the entire Through Pedestrian Zone, if possible.

This can be accomplished either by raising the curb so that the cross-slope of the entire sidewalk can be 1:50, or by placing the more steeply angled slope within the Furnishings Zone and/or the Frontage Zone (see illustration).

If the above measures are not sufficient and additional slope is required to match grades, the cross slope within the Through Pedestrian Zone may be as much as 1:25, provided that a 3 ft (900 mm) wide portion within the Through Pedestrian Zone remains at 1:50 cross slope, as shown in the illustration. The approach will only be acceptable when staff determines that no other approach or design is feasible.

Frontage Zone

The Frontage Zone is the area between the Through Pedestrian Zone and the building. The frontage zone may exist on private property if vertical elements such as buildings, fences, hedges etc. are appropriately setback from the throughway. This zone allows pedestrians a comfortable "shy away" distance from the building fronts, in areas where buildings are at the lot line, or from elements such as fences and hedges on private property.

Where no Furnishings Zone exists, elements that would normally be sited in that zone, such as transit shelters and benches, telephone kiosks, signal and street lighting poles and controller boxes, traffic and parking signs, and utility poles, may occupy the Frontage Zone. In some cases, easements or additional right-of-way may be required to allow for these items. Some frontage zone areas may also contain historically sensitive elements on private property, such as sand stones walls.

Private temporary uses such as sidewalk cafes (where allowed by Code[15]) may occupy the Frontage Zone, so long as the Through Pedestrian Zone is maintained.

Temporary uses such as sidewalk cafes may occupy the Frontage Zone, providing the Through Pedestrian Zone remains clear.

ENCROACHMENTS[16]

Fences and walls, when permitted, must be at least 1 ft (300 mm) behind the back of the sidewalk (or the future sidewalk, if none exists).[17] Encroachments into the right-of-way should not be permitted where the existing sidewalk corridor is less than the recommended width shown in Table VIII-2 on page 218.

Elements such as standpipe systems for fire safety may project into the Frontage Zone from a building face a maximum of 1 ft (300 mm) per the City Engineer, but not more than 4 in (100 mm) if they project in the area between 2 ft 3 in and 6 ft 8 in (685 mm and 2030 mm) above the sidewalk, per the ADA.

ADJACENT PARKING LOTS

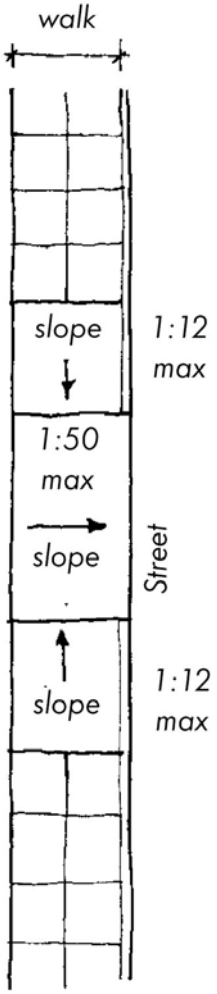
In existing parking lots, landscape and lighting are guided by the Santa Barbara Municipal Code 28.90.050. Where there is no landscaping between parked vehicles and the right-of-way, wheel stops or other means such as walls or fences should be used to prevent parked vehicles from overhanging into the Frontage Zone.

Elements such as standpipe systems may project into the Frontage Zone. Care must be taken to assure compliance with the ADA.

Driveways

The number of driveways accessing public rights of way should be limited to one per parcel to minimize vehicle access conflicts with pedestrians, bikes, and other vehicles. Access to some commercial properties may require more than one access point as determined by the Public Works Department. Driveway widths should also be minimized to reduce entrance speeds, maximize landscaping opportunities, and reduce pedestrian exposure at vehicle access points.

[15] Code 9.95, Outdoor Dining
[16] Recommend adding an encroachment policy to Code
[17] Recommend adding guidelines to Code relating fences and walls to sidewalks



Dropped driveway in constrained width situation (scoring should continue across drive).

DRIVEWAY APRONS[18]

Wherever possible, driveway aprons should not intrude into the Through Pedestrian Zone because a stable, continuous sidewalk grade is a far superior pedestrian experience, particularly for disabled residents, elderly, and others with physical limitations. Also, motorists treat driveway aprons as theirs, while they are more likely to stay clear of and be cautious around a normal sidewalk.

PREFERRED DRIVEWAY CONDITION IN SIDEWALK CORRIDORS

In the preferred condition, the Through Pedestrian Zone is maintained at the sidewalk cross slope of 1:50 across the entire driveway, and is scored with a sidewalk pattern. The sloped portion of the driveway apron is located entirely within the Furnishings Zone and should be sloped to the maximum allowable slope of 1:10 to minimize the width of the sloped apron. Where necessary to keep the driveway apron slope from exceeding 1:10, the sidewalk may be partially dropped to meet the grade at the top of the apron. This is preferred to extending the sloped apron into the Through Pedestrian Zone.

CONSTRAINED CONDITION FOR DRIVEWAYS IN SIDEWALK CORRIDORS

In cases where sidewalk widths are too constrained for the preferred condition, a "dropped driveway" may be used to meet ADA requirements. Typically, this design will be appropriate only where the Sidewalk Corridor width is less than 8 ft (2.4 m). The sidewalk scoring grid should be continued across the driveway in the Through Pedestrian Zone.

An alternate approach to the constrained condition is to provide a bypass walk at the top of the driveway. However, as this results in a slight detour for the pedestrian, designers should consider this option only where there are problems with the dropped driveway, such as steep grades, or where the dropped driveway results in stormwater drainage problems like puddling or drainage onto private property.

NO SIDEWALKS ALONG SIGNALIZED DRIVEWAYS

Occasionally a driveway must be signalized. In such cases, the design treatment of the driveway apron should avoid the appearance of a continuation of the sidewalk. In general, pedestrians do not expect to be controlled by pedestrian signal indications on a sidewalk.

[18] Standard Detail 1-003.0; 1-003.2 – 1-003.3

Bus Stops

Because of their disability, people who are disabled use buses more often than fully able people. Bus stops provide transition between sidewalks and buses. In order for this transition to be made, a continuous paved path must link the sidewalk to the bus. ADAAG specifies a minimum bus landing pad of 8 ft (2.4 m) by 5 ft (1.5 m). The Santa Barbara Metropolitan Transit district uses landing pads of 6 ft wide by 8 ft deep by 4 in high (1.8 m by 2.4 m by 102 mm).

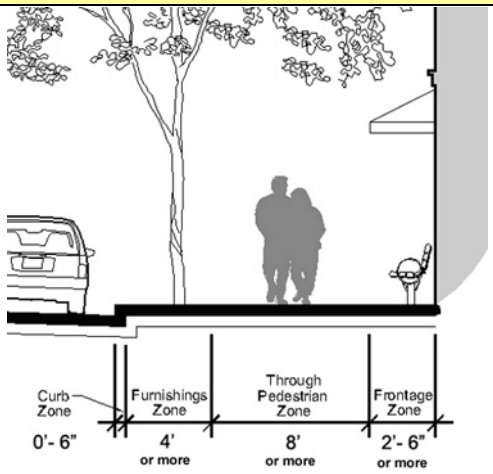
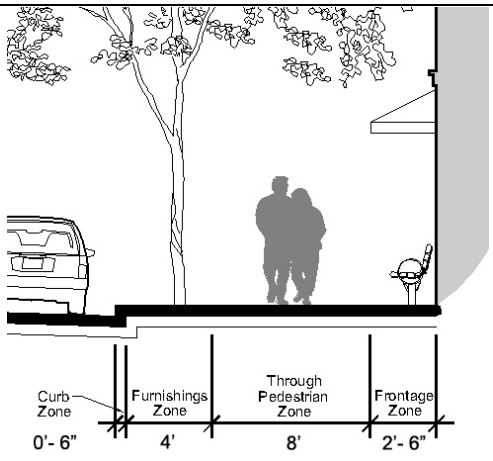
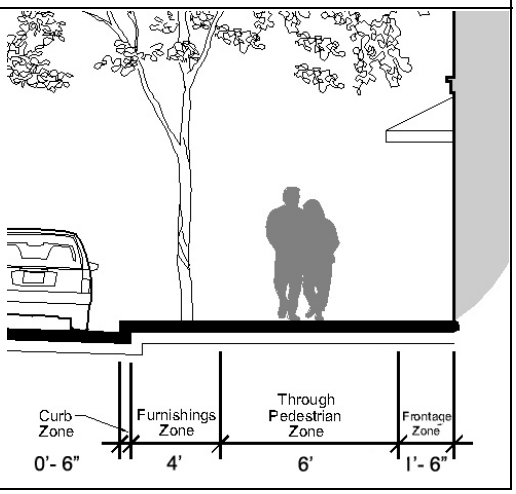
Other High Pedestrian Use Guidelines

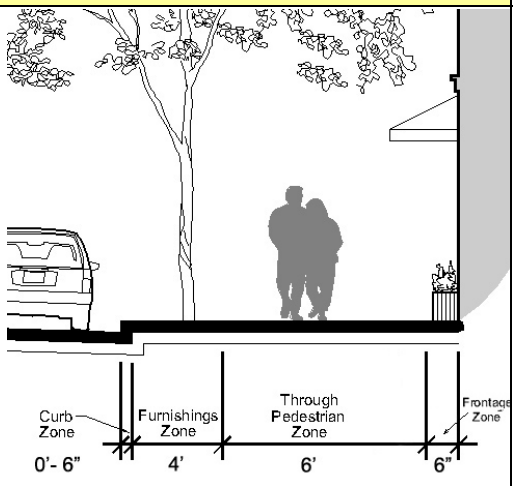
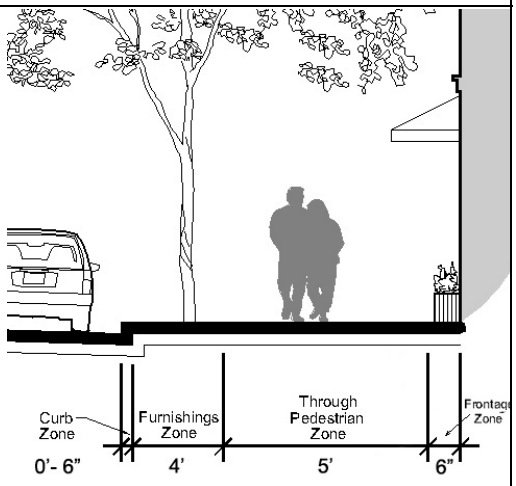
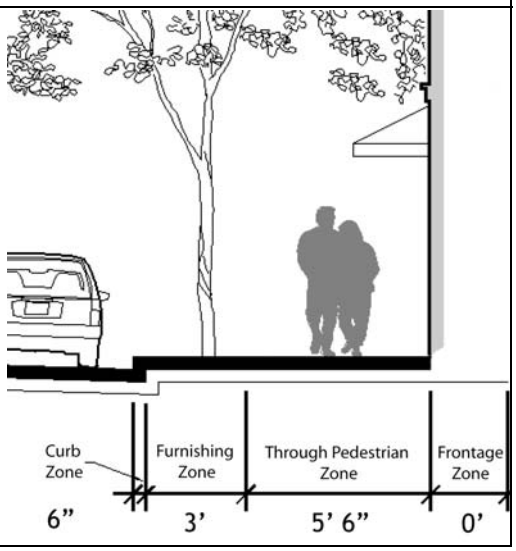
- Pedestrian and driver sight distances should be maintained near driveways.
- Driveways and curb cuts should be minimized in areas with pedestrian traffic.
- Landscape buffers and/or low walls should separate sidewalks from parking and off-street passenger loading areas.
- Scored or textured concrete should be used where appropriate to alert sight-impaired people of the sidewalk edge.
- Staircases or ADA-compliant ramps should be provided to allow beach access from private or public properties in Coastal Zones.

Alleys

It should be noted that alleys have an integral pedestrian component combining slow speed vehicle movement to access homes and businesses with pedestrian movement for connectivity. Often, alleys serve as pedestrian pathways, offering an alternative to a busy road. Alleys should be designed as if they were intended as pedestrian pathways that serve limited, slow speed vehicle movement. Design considerations should include sight lines, speed, width, roadway crossings, and surface.

Table VIII-2. Sidewalk Zone Table – High Pedestrian Use Areas

Application	Recommended Configuration
Recommended minimums in High Pedestrian Use Areas along State Street, especially for arterial streets or where ROW width is 80 feet or greater. Where outdoor café seating is desired, the Frontage Zone may be wider, so long as the Through Pedestrian Zone is maintained.	
Recommended minimums in High Pedestrian Use Areas along retail-commercial streets, especially for arterial streets or where ROW width is 80 feet or greater. Where outdoor café seating is desired, the Frontage Zone may be wider, so long as the Through Pedestrian Zone is maintained.	
Recommended minimums for walkways along other commercial streets, other local streets in highly traveled pedestrian areas, and for streets where ROW width is 60 feet or greater.	

Application	Recommended Configuration
Recommended minimums for walkways along local service streets where ROW is 50 feet or greater.	
Recommended for local service walkways in residential zones where ROW width is less than 50 feet.	
NOT RECOMMENDED for new construction or reconstruction. Accepted in existing constrained conditions when increasing the sidewalk Zone is not practical.	

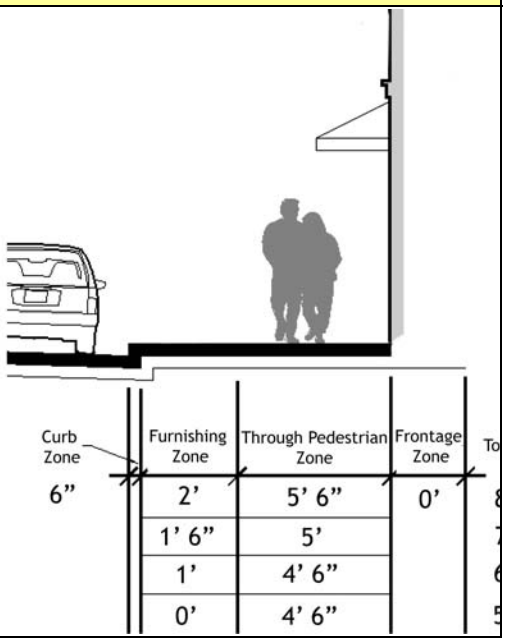
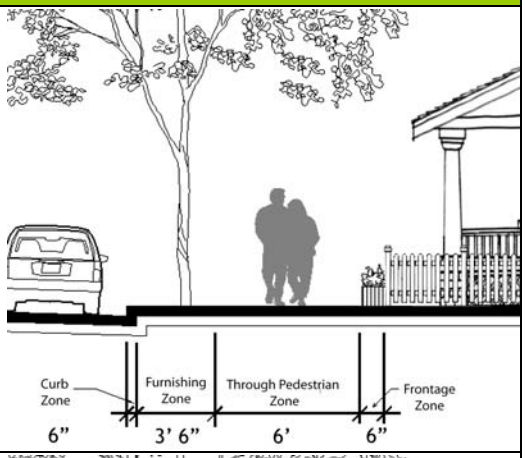
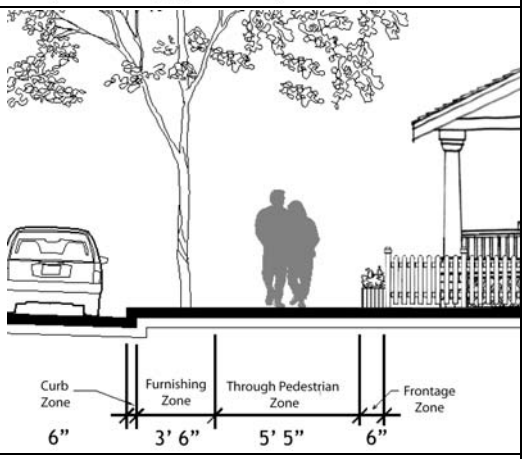
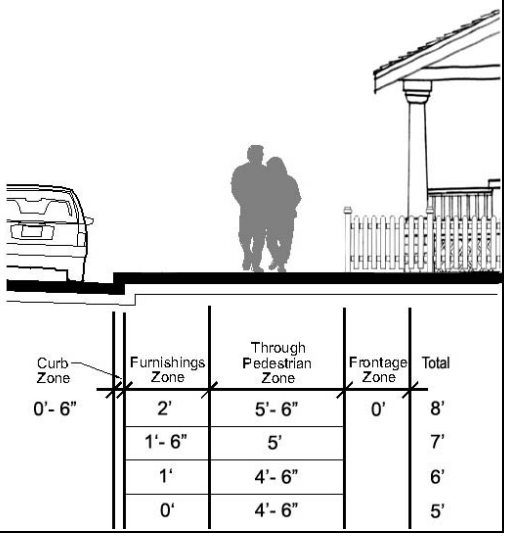
Application	Recommended Configuration
NOT RECOMMENDED. Accepted in existing constrained conditions when increasing the Sidewalk Zone width is not practical.	

Table VIII-3. Sidewalk Zone Table – Low Pedestrian Use Areas

Application	Recommended Configuration
Recommended minimums in Low Pedestrian Use areas along medium- and high-density residential streets, especially for arterial streets or where right-of-way (ROW) width is 50 feet or greater.	
Recommended minimums for low-density residential street where ROW width is less than 50 feet.	
Accepted in existing constrained conditions when increasing the sidewalk corridor width is not practical.	

Guidelines for Street Corners (Strategy 4.1.3)

Corners are the places where ways converge, where walkers wait to cross, and where people stop to converse or get their bearings.

Corners should be accessible, clear of obstructions, and provide good visibility and separation from traffic for pedestrians.

Pedestrian activities are concentrated at street corners. These are the places where ways converge, where walkers wait for crossing opportunities, and where people are most likely to stop and converse with others.

Corners are also the place where access between the crosswalk at street grade and the (usually) raised sidewalk must be provided.

Street corners are important in the larger scheme of street systems. They are the logical location for hardware such as street name signs and traffic control signs or traffic signal bases. The design of the corner affects the speed with which turning traffic can maneuver through an intersection. Visibility at the corner is an issue for all users of the street system.

Attributes of Good Street Corners

There are five attributes of good street corners within the pedestrian transportation network:

Clear Space — Corners should be clear of obstructions, and have enough space to accommodate the typical number of pedestrians waiting to cross. They should also have enough room for curb ramps, for transit stops where appropriate, and for street conversations.

Visibility — It is critical that pedestrians on the corner have a good view of the travel lanes and that motorists in the travel lanes can easily see waiting pedestrians.

Legibility — Symbols, marks, and signs used at corners should clearly indicate what actions the pedestrian should take.

Accessibility — All corner features, such as ramps, landings, call buttons, signs, symbols, marks, textures, etc., must meet accessibility standards.

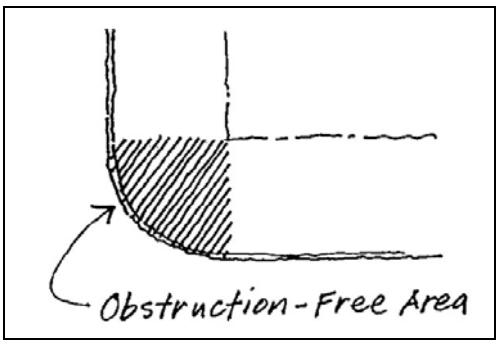
Separation from Traffic — Corner design and construction must be effective in discouraging turning vehicles from driving over the pedestrian area.

Designing and Implementing Corner Improvements

Obstruction-Free Area

Since the corner area must accommodate a concentration of pedestrian activities, and since sight lines need to be maintained for all street users, it is important to maintain an area that is free of obstructions.

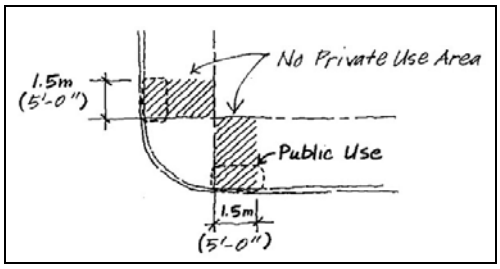
The obstruction-free area of a street corner is the space between the curb and the lines created by extending the property line (or the line of a public walkway easement) to the curb face, as shown in the adjacent illustration. Signal poles, street lights, telephone poles, hydrants, trees, landscape, benches, signs, controller boxes, private uses, and other vertical elements should not be located within this area.



The obstruction-free area of a street corner is the space between the curb and the lines created by extending the property line to the curb face.

Keeping these elements out of the Obstruction-Free Area should not result in placing them in other locations where they are an obstruction to pedestrians, such as the Through Pedestrian Zone in the Sidewalk Corridor.

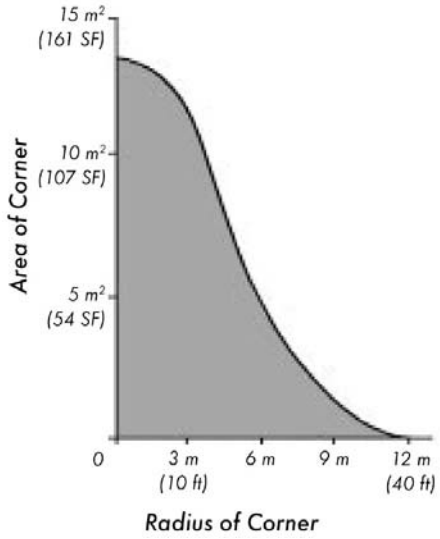
Exceptions to the obstruction-free guideline include bollards to separate pedestrians from traffic, and low posts for pedestrian call buttons at actuated signal controls.



"No private use" area on either side of a corner. Public uses are encouraged to locate within the Furnishings Zone of this area.

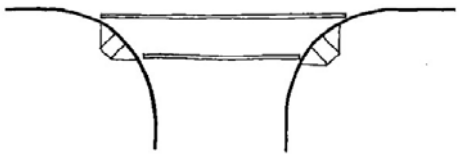
UTILITY POLES

Frequently there are existing utility poles at the corners. Ideally, when a utility pole within the Obstruction-Free Area is to be replaced, it would be replaced outside the area. In many cases, the pole at the corner is associated with lines running on both streets of the intersection and it may be difficult to relocate the pole. If possible, two poles should be employed so that the single pole can be removed from the Obstruction-Free Area.



Graph showing how pedestrian area is reduced by increasing the curb radius at a typical corner where two 12 ft (3.7 m) sidewalks intersect. Note that pedestrian area begins to fall off sharply as the radius gets larger than 10 ft (3 m).

Tight curb radius means a shorter crosswalk.



Wide curb radius means a longer crosswalk.

"No Private Use" Area

To provide enough space for all the hardware that must be accommodated near the corner area, and to ensure good visibility at the corners, private temporary uses such as street vendors, sidewalk cafes, A-boards and newspaper vending machines are not permitted in an area 5 ft (1.5 m) back from the extension of the property line at any corner, as shown in the adjacent illustration.[19]

Adequate Pedestrian Area at Street Corners

Street corners should be large enough to adequately serve their multiple public functions. They must accommodate pedestrians walking through, those waiting to cross, and those who meet and stop to talk. The greater the pedestrian volume, the greater the area needed at each corner. Corners in High Pedestrian Use areas and corners that accommodate transit stops require the greatest area.

Unfortunately, other design considerations sometimes erode the space available for pedestrian activities at corners. Of particular concern is the choice of curb radius. As curb radius increases, the area of the corner decreases, as shown in the graph at the left.

Several factors determine the ideal pedestrian area at the street corner. Among these are the expected volume of pedestrians on each sidewalk, the length of the expected pedestrian waiting time at the corner, and the size of the Through Pedestrian Zone extending through the corner. Although quantitative methods have been developed to calculate the level of service of corners,[20] in most cases it is not necessary to perform calculations if the needs of pedestrians are properly weighed against the needs of other modes.

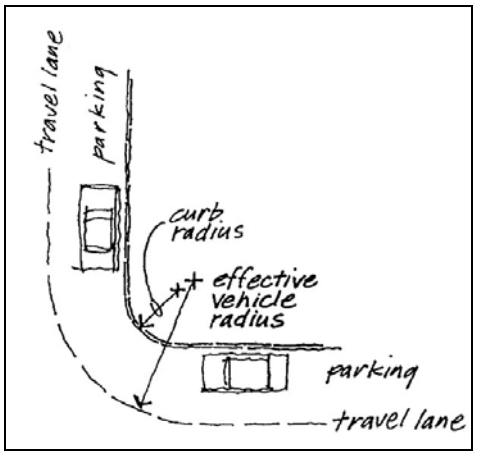
Where additional pedestrian area at the corner is desirable, for example because existing conditions are constrained or because a large corner radius is required, the designer may consider such strategies as the use of curb extensions, or the acquisition of additional right-of-way or a public walkway easement.

[19] Recommend adding private temporary use guidelines to Code

[20] Ideally, the corner should provide at least 5 sq ft (0.5 sq m) for each pedestrian expected to wait or pass by during any given period. In Pedestrian Districts and shopping areas, pedestrian volumes at corners may reach 20 pedestrians per minute. In areas of especially high pedestrian volume, the optimum size can be calculated using the methodology outlined in the Highway Capacity Manual, Chapter 13, Pedestrians.

Radius of the Curb at Corners

In general, the smaller the curb radius, the better for pedestrians. In comparison to a large curb radius, a tight curb radius provides more pedestrian area at the corner, allows more flexibility in the placement of curb ramps, results in a shorter crosswalk, and requires vehicles to slow more as they turn the corner. A small curb radius is also beneficial for street sweeping operations. The presence of a lane for parking or bicycles creates an "effective radius" that allows the designer to choose a radius for the curb that is smaller than the turning radius required by the design vehicle.



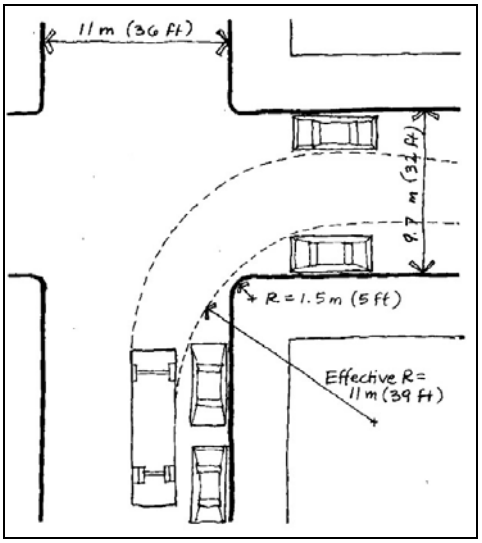
An "effective radius" is created by the presence of a parking lane or bike lane.

CHOOSING A CURB RADIUS

Several factors govern the choice of curb radius in any given location. These include the desired pedestrian area of the corner, traffic turning movements, the turning radius of the design vehicle, the geometry of the intersection, the street classifications, and whether there is parking or a bike lane (or both) between the travel lane and the curb.

The designer must balance all the factors, keeping in mind that the chosen radius should be the smallest possible for the circumstances. The radius may be as small as 3 ft (900 mm) where there are no turning movements, or 5 ft (1.5 m) where there are turning movements and there is adequate street width and a larger effective curb radius created by parking or bike lanes.

Designers sometimes consider that on-street parking will begin or end at the point of tangency or point of curvature of the corner radius. In practice, however, this point is not always evident in the field. Parking control should not be a factor in selecting curb radius.



Where there is an effective curb radius sufficient for turning vehicles, the actual curb radius may be as small as 5 ft (1.5 m).

Curb Ramps[21]

Curb ramps are necessary for people who use wheelchairs to access sidewalks and crosswalks. They help people with other mobility impairments to transition easily between sidewalks and crosswalks. Curb ramps also help people with strollers or rolling carts. ADA requires installation of curb ramps in new sidewalks, as well as retrofitting of existing sidewalks.

Curb ramp components (see Figure VIII-1) include:

[21] Standard Details 1-007.1 through 1-007.5

- Landing – the level area at the top of a curb ramp facing the ramp path. Landings allow wheelchairs to enter and exit a curb ramp, as well as travel along the sidewalk without tipping or tilting.
- Approach – portion of the sidewalk on either side of the landing. Approaches provide space for wheelchairs to prepare to enter landings.
- Flare – the sloped transition between the curb and sidewalk. Flares provide a sloped transition between the sidewalk and curb ramp to help to prevent pedestrians from tripping over an abrupt change in level.
- Ramp – sloped transition between the sidewalk and street where the grade is constant and cross slope is at a minimum. Ramps are the main pathway between the sidewalk and street.
- Gutter – the trough that runs between the curb or curb ramp and the street.

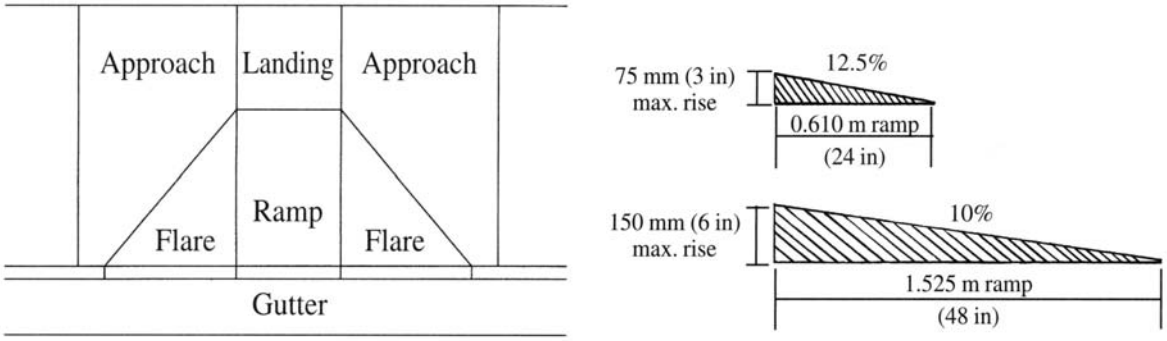


Figure VIII-1. Curb Ramp Components, and Alternate Ramp Slopes

A number of different types of curb ramps exist. The type selected should correspond to the design requirements of a given location.

PERPENDICULAR CURB RAMPS

Perpendicular curb ramps allow for a convenient, direct path of travel with a 90-degree angle to the curb. Perpendicular curb ramps maximize access for pedestrians at intersections. They reduce the distance required to cross the street as compared with diagonal ramps. They often require two ramps, one for each direction of travel across the street. Perpendicular curb ramps without level landings are difficult for wheelchairs to negotiate. They require more space than single diagonal ramps (see Figure VIII-2). Where sidewalks are narrow, there may not be space for two perpendicular curb ramps and their landings. Adding curb extensions can create additional space to accommodate two perpendicular ramps. Newly constructed sidewalks should include two perpendicular ramps. Retrofitted ramps in multi-family neighborhoods and commercial areas should include perpendicular ramps, except where space is inadequate.

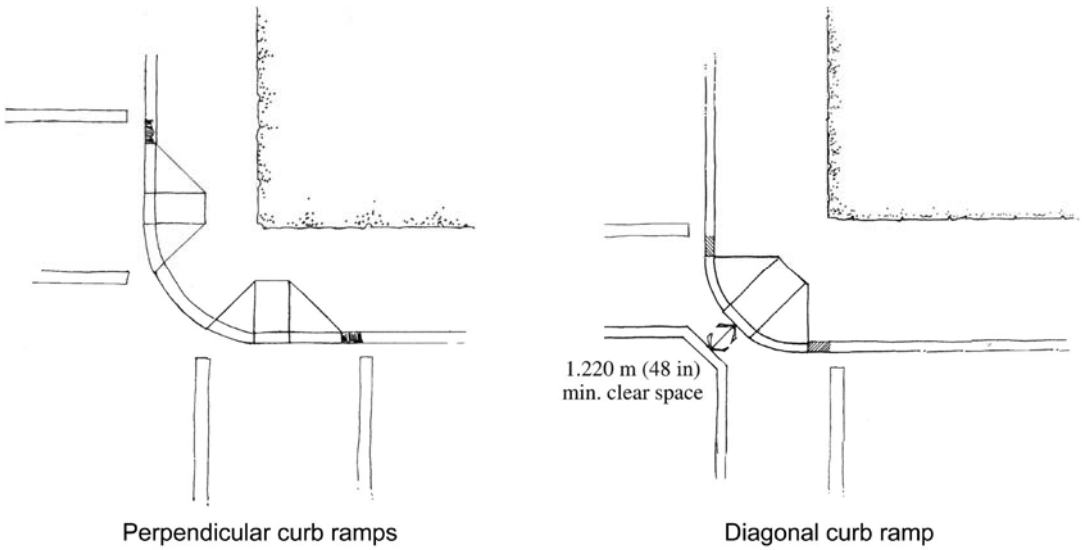


Figure VIII-2. Perpendicular and Diagonal Curb Ramps

DIAGONAL CURB RAMPS

Diagonal curb ramps (see Figure VIII-2) are single curb ramps at the apex of the corner. They cause the user to travel towards the center of the intersection where they may fall into danger of being hit by turning cars. They also require the user to take a longer, circuitous travel path to the other side than a perpendicular ramp. Being in the intersection longer exposes the user to greater risk of being hit by vehicles. Diagonal curb ramps cost less than perpendicular ramps since they are single ramps. Diagonal curb ramps are generally desirable only on streets with little motor vehicle traffic where the advantage of installing more curb ramps compensates for the drawbacks of its design.

PARALLEL CURB RAMPS

Parallel curb ramps are oriented parallel to the street. They are generally used on narrow sidewalks where inadequate space exists to install other ramps. The sidewalk itself ramps down, as shown in Figure VIII-3. Parallel curb ramps require pedestrians who are continuing along the sidewalk to ramp down and up. Where space exists in a planting strip, parallel curb ramps can be designed in combination with perpendicular ramps to reduce the ramping for through pedestrians.

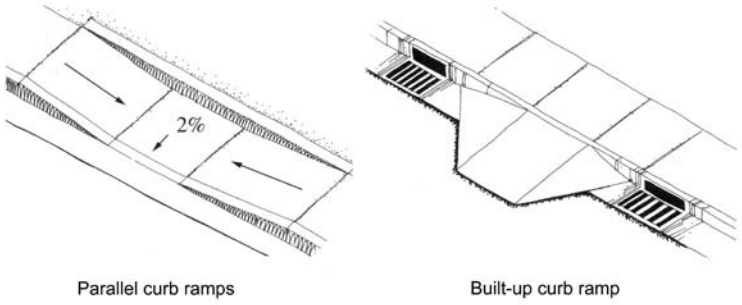


Figure VIII-3. Parallel and Built-up Curb Ramps

BUILT-UP CURB RAMPS AND CURB RAMPS WITH CURB EXTENSIONS

Built-up curb ramps project from the curb into the gutter and street. They aren't often used on streets, but may be used where the sidewalk is narrow and other options for ramps are not available. They are oriented in the same direction as perpendicular ramps at 90 degrees to the streets. Some built-up curb ramps are partial, and begin their slope at the sidewalk and end it at the end of the gutter. Built-up curb ramps must be designed with provisions for drainage. Perpendicular ramps on curb extensions are preferable to built-up curb ramps and have the same design guidelines.

DEPRESSED CORNERS

Depressed corners gradually lower the level of the sidewalk through a slope that meets the grade of the street. The corners at the intersection of Milpas Street and Haley Street are similar to depressed corners, although the street was built up to the sidewalk, rather than the other way around. Depressed corners offer the same advantages of perpendicular curb ramps. However, they are generally not recommended since they make it difficult for people who are visually and cognitively impaired to distinguish the transition from the sidewalk and street. They can confuse guide dogs as well. Motor vehicles also intrude onto depressed corners. For these reasons, where depressed corners exist, they should be retrofitted with bollards or other intermittent barriers to prevent cars from traveling on the sidewalk. Detectable warnings should also be placed at the edge of the sidewalk.

Table VIII-4 shows the standards and guidelines for curb ramps.

Table VIII-4. Design Standards and Guidelines for Curb Ramps

Curb Ramp Type	Characteristic	US Access Board Guidelines[22]	Other
Perpendicular	Maximum slope of ramps	ramp not steeper than 8.35% (1:12)	
	Maximum cross-slope of ramps	2%	
	Maximum slope of flared sides	10%	
	Minimum ramp width	48 in (1.22 m)	
	Minimum landing length	36 in (0.915 m); if landing is less than 48 in (1.22 m)	
	Minimum landing width		
	Maximum gutter slope	5%	Gutter should be designed to not retain water
	Changes in level	flush	
	Truncated domes	24 in (610 mm)	
Diagonal	Maximum slope of ramps	not steeper than 1:12 (8.33%)	
	Maximum cross-slope of ramps	2%	
	Maximum slope of flared sides	10%	
	Minimum ramp width	48 in (1.22 m)	
	Minimum landing length	36 in (0.915 m); if landing is less than 48 in (1.22 m)	

[22] US Access Board Guidelines as of July 23, 2004.

Curb Ramp Type	Characteristic	US Access Board Guidelines[22]	Other
	Minimum landing width	48 in (1.22 m)	
	Maximum gutter slope	2%	Gutter should be designed to not retain water
	Changes in level	none	
	Minimum clear space	48 in (1.22 m)	
Parallel and combination	Maximum slope of ramps	not steeper than 8.33% (1:12)	
	Maximum cross-slope of ramps	2%	
	Maximum slope of flared sides	10%	
	Minimum ramp width	48 in (1.22 m)	
	Minimum landing length	36 in (0.915 m); if landing is less than 48 in (1.22 m)	
	Minimum landing width	48 in (1.22 m)	
	Maximum landing slope	2%	
	Maximum gutter slope	5%	Gutter should be designed to not retain water
	Changes in level	none	
	Truncated domes (parallel); detectable warnings (combination)	24 in (610 mm)	
Curb extensions and built-up	Maximum slope of ramps	not steeper than 8.33% (1:12)	
	Maximum cross-slope of ramps	2%	
	Maximum slope of flared sides	10%	
	Minimum ramp width	48 in (1.22 m)	
	Minimum landing length	36 in (0.915 m); if landing is less than 48 in (1.22 m)	
	Minimum landing width	48 in (1.22 m)	
	Maximum gutter slope	5%	Gutter should be designed to not retain water
	Changes in level	flush (curb ext.); none (built-up)	
	Detectable warnings	24 in (610 mm)	

Accommodating People with Visual Impairments

People with visual impairments must gather information about their traveling environment in different ways from fully sighted people. While people with full vision primarily use their sight to find their way, people with vision impairments use other cues, such as the sound of traffic and its direction, changes in slope such as are found on curb ramps, textures, and color contrast. Good design provides these cues for them. Moreover, predictability in the walking environment makes navigation easier. Intersections that are at 90-degree angles with simple crossing patterns are easily discerned, as compared with irregularly shaped intersections or complex intersections. If devices are used to help the visually

impaired, such as audible pedestrian signals or truncated domes, consistency is important. The same devices should be used uniformly. The following section identifies and provides guidance for the use of accessibility information added to the pedestrian environment.

RAISED TACTILE DEVICES USED AS DETECTABLE WARNINGS (TRUNCATED DOMES)

Raised tactile devices can be very effective in alerting people with visual impairments of changes in the pedestrian environment, such as the transition between a curb ramp and the street. These devices are most effective when adjacent to smooth pavement so the difference is easily detected. Similarly, they must also provide color contrast so partially sighted people can see them.

The ADAAG standards for detectable warnings are:

- Bottom diameter: 0.9 in (23 mm)
- Top diameter: 0.4 in (10 mm)
- Height: 0.2 in (5 mm)
- Center-to-center spacing: 2.35 in (60 mm)
- Visual contrast: Shall contrast visually with adjoining surfaces, light-on-dark, or dark-on-light. The material needs to provide contrast and shall be an integral part of the walking surface.

U.S. Access Board recommendations include:

- Visual contrast: at least 70%
- Width: 24 in (610 mm)
- Location: 6 in to 8 in (152 mm to 200 mm) from the bottom of the ramp

Used at:

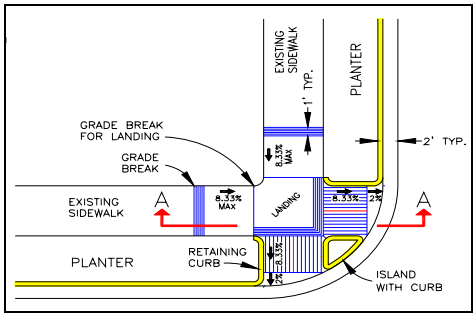
- The edge of depressed corners
- The border of raised crosswalks and intersections
- The base of curb ramps
- The border of medians
- The edge of transit platforms and where railroad tracks cross the sidewalk

GROOVES

Grooves are indentations at the top of curb ramps. Sometimes they are not detectable by canes, unless the pedestrian's cane has constant contact with the sidewalk. For pedestrian facilities along Caltrans highways, Caltrans sets a standard requiring grooves to form a border at the level surface of the sidewalk of 12 in (300 mm).

Recommended Landing Height at Corners

A corner landing height of 3 in (75 mm) is recommended in order to have curb ramps that are in scale with other elements of the pedestrian realm.



Perpendicular curb ramp

Santa Barbara's standard height for new curbs is 7 in (175 mm). With a maximum slope of 1:12 and a typical sidewalk cross slope of 1:50 for drainage, the rule of thumb for ramp length is $l = 16h$, where l is the length of the ramp and h is the height of the curb. A 7 in (175 mm) curb means a ramp length of 9 ft 4 in (2840 mm). On many Santa Barbara corners with the required landing at the top, such a ramp could not be accommodated.

As the ramp length increases, the wing area also increases, which reduces the functional area for pedestrians at the corner.

Keeping the landing height at 3 in (75 mm) above the street level at the corner allows the ramps to be only about 4 ft (1220 mm) long. With ramps at this scale, it is easier to site two ramps and easier to maintain adequate pedestrian area at the corner.

A transition from the curb height along the sidewalk corridor may be achieved through the use of a parallel ramp, or by slightly raising the level of the street in the intersection. Many existing corners in Santa Barbara have curb heights of 3 in (75 mm) or less due to pavement overlays.

The low-landing strategy involves tradeoffs, since the reduced curb height provides less protection from storm water and from turning vehicles than a higher curb. Care in locating inlets can solve drainage problems. A higher curb may be desired where low-floor transit stops are sited, or where vehicle speeds are high, or in the vicinity of rail crossings.

Given the advantages of a curb as noted in The Curb Zone on page 206, it is not recommended to drop the curb to street level for the entire corner area.

ADA-Compliant Ramps

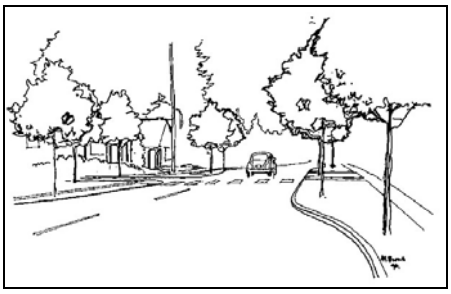
ADA-compliant wheelchair ramps should be provided at all corners. Every corner should have two ramps: one for each direction of travel. ADA guidelines regarding the grade and requirements for landings at wheelchair ramp locations should also be followed.

Two ramps is the preferred design.

Ramp Maintenance

It is critical to accessibility that the interface between the ramp and the street be maintained adequately. The asphaltic concrete street section has a shorter life cycle than a Santa Barbara cement concrete ramp. Potholes in the asphalt at the foot of the ramp can catch the front wheels of a wheelchair, causing it to tip over.

In some cases, existing ramps and streets create a tipping hazard because of a sharp change in slope. As an interim solution, this sharp transition can be eased with a tapered infill of asphalt concrete at the foot of the ramp.



Curb extensions shorten the crossing distance and allow pedestrians to see and be seen before entering the crosswalk.

Locating Pedestrian Call Buttons

Pedestrian signal call buttons are used in cases where there are actuated signals for the signal controller to detect the presence of pedestrians. (See "Conflicting Movements of Pedestrians and Vehicles at Signals" on page 238 for a further discussion of the use of call buttons.)

Where needed, pedestrian call buttons should be located to meet the following criteria:

- the closest push button to a crosswalk should call the pedestrian signal for that crosswalk
- an arrow indicator should show which crosswalk the button will affect
- the push button should be visible to a pedestrian facing the crosswalk, unless space constraints dictate another button placement
- the push button must be accessible from the level landing at the top of the curb ramp, or from the dropped landing of a parallel curb ramp

Where necessary, pedestrian call buttons may be located on low posts placed within the Obstruction-free Area of the corner.

Curb Extensions[23]

Curb extensions (sometimes called curb bulbs or bulb-outs) have many benefits for pedestrians. They shorten the crossing distance, provide additional space at the corner (simplifying the placement of elements like curb ramps), and allow pedestrians to see and be seen before entering the crosswalk.

LOCATIONS FOR CURB EXTENSIONS

Curb extensions may be used at any corner location, or at any mid-block location where there is a marked crosswalk, provided there is a parking lane into which the curb may be extended. Curb extensions are not generally used where there is no parking lane because of the potential hazard to bicycle travel.

[23] Standard Details 1-007.1 through 1-007.5

In High Pedestrian Use areas, curb extensions are a preferred element for corner reconstruction except where there are extenuating design considerations such as the turning radius of the design vehicle, or transit and on-street parking factors.

DESIGN OF CURB EXTENSIONS

Curbs may be extended into one or both streets at a corner. The principles of an Obstruction-free Area and No Private Use Area also apply to the curb extension.

The design of curb extensions is guided by Standard Details 1-007.1 through 1-007.5. Additional guidelines can be found in Table VIII-6 on page 245. Curb extensions may include transit stops, eliminating the need for the bus to pull out of the travel lane to load and unload passengers.

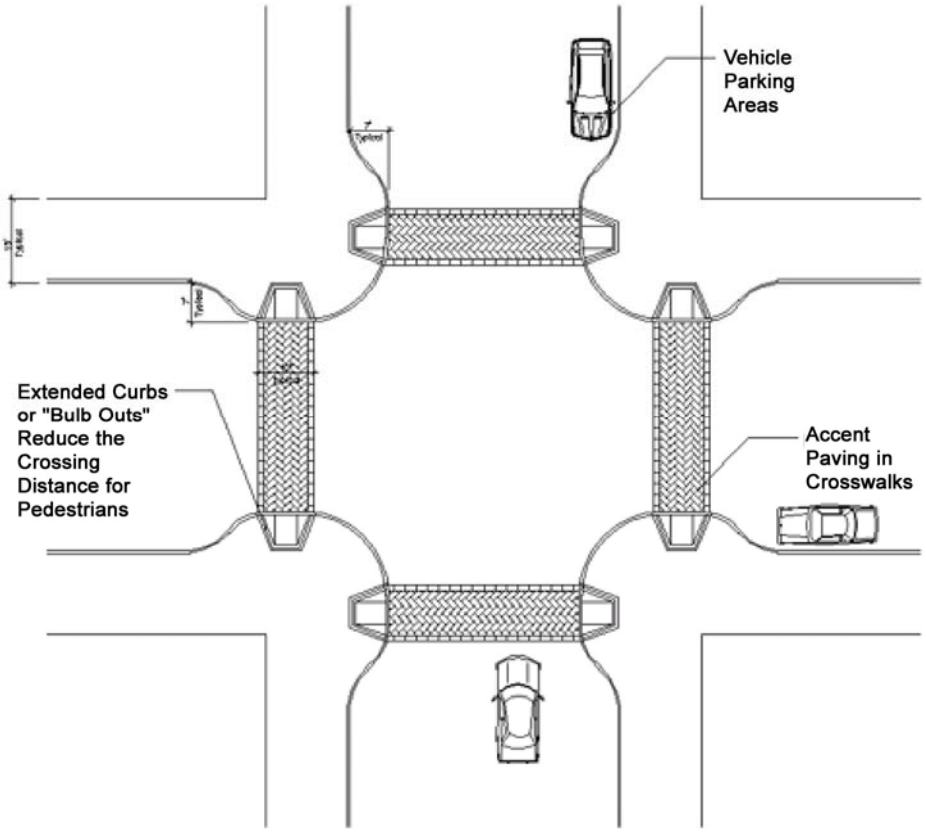


Figure VIII-4. Design of Curb Extensions

Guidelines for Crosswalks (Strategy 4.1.4)

Crosswalks are a critical element of the pedestrian network. It is of little use to have a complete sidewalk system if pedestrians cannot safely and conveniently cross intervening streets. Safe crosswalks support other transportation modes as well. Transit riders, motorists, and bicyclists all may need to cross the street as pedestrians at some point in their trip.

Almost every pedestrian trip includes crossing the street.

Attributes of Good Crosswalks

There are several attributes of good crosswalks. These can be realized through a variety of tools and designs. Some of these tools are described in the guidelines that follow.

Clarity — It is obvious where to cross and easy to understand possible conflict points with traffic.

Visibility — The location and illumination of the crosswalk allows pedestrians to see and be seen by approaching traffic while crossing.

Appropriate intervals — There is a reasonable match between the frequency of good crossing opportunities along a street and the potential demand for crossing.

Short wait — The pedestrian does not have to wait unreasonably long for an opportunity to cross.

Adequate crossing time — The time available for crossing accommodates users of all abilities.

Limited exposure — Conflict points with traffic are few and the distance to cross is short or is divided into shorter segments with refuges.

Continuous path — The crosswalk is a direct continuation of the pedestrian's travel path.

Clear crossing — The crosswalk is free of barriers, obstacles and hazards.

Designing and Implementing Crosswalk Improvements

Crossing Treatments

In these guidelines, the term "crossing treatment" refers to physical treatment of a crosswalk to make it safer and more convenient for pedestrian travel. A crossing treatment may include the use of such tools as *median refuges, curb extensions,* or *pavement markings* at crosswalks. Many of these tools are presented in detail in Table VIII-6 on page 245.

Designers should examine the need for crossing treatments in all new projects or retrofits to existing streets. Non-conforming or unique circumstances must be evaluated on a case-by-case basis, with good engineering judgment guiding the recommended approach.

Frequency of Crossing Opportunities

In general, whatever their mode, people will not travel out of direction unless it is necessary. This behavior is observed in pedestrians, who will cross the street wherever they feel it is convenient.

The distance between comfortable opportunities to cross a street should be related to the frequency of uses along the street that generate crossings (shops, High Pedestrian Use areas, etc.). In areas with many such generators, like High Pedestrian Use areas, opportunities to cross should be very frequent. In areas where generators are less frequent, good crossing opportunities may also be provided with less frequency.

Table VIII-5. Frequency of Crossing Treatments

Where	Generally not farther apart than	Generally not closer together than
In High Pedestrian Use Areas	200 – 300 ft (60 – 90 m) where blocks are longer than 400 ft (120 m)	150 ft (45 m)
On Local Street Walkways and in Low Pedestrian Use Areas	Varies, based on adjacent uses. Do not prohibit crossing for more than 120 m (400 ft).	150 ft (45 m)

Locating Mid-block Crosswalks

Mid-block crosswalks are installed where there is a significant demand for crossing and no nearby existing crosswalks.

Where mid-block crossing treatments are employed, they should be aligned where possible with logical pedestrian travel patterns. For example, it makes sense to locate a mid-block crossing where a public walkway easement or pedestrian connector meets a street.

See Table VIII-6 on page 245 for guidelines on mid-block crosswalks.

Change in paving denotes a mid-block crossing.

Pedestrian Delay at Unsignalized Crosswalks

Pedestrian delay occurs when a pedestrian must wait at the curb for an interval before it is safe to cross the street. At unsignalized crosswalks, pedestrian delay occurs when pedestrians feel they must wait for a safe gap in the traffic before crossing. Although pedestrians have the right-of-way, many people feel safer waiting for a gap than asserting their right to cross.

Mid-block crosswalks are installed where there is a significant demand for crossing and no nearby existing crosswalks.

Curb extensions can shorten crossing distance.

Average pedestrian waiting time should generally be no more than sixty seconds at an unsignalized crossing.[24]

Ideally, safe gaps should occur frequently enough that pedestrians will not be tempted to cross in unsafe gaps. Pedestrian delay at unsignalized crosswalks can be reduced either by adjustments to signals at nearby intersections (to increase gaps through platooning of traffic) or by the addition of median refuge islands (see Table VIII-6).

Minimizing Exposure During Crossing

Crossing the street is both safer and more convenient when the crossing distance is short. Pedestrian exposure to travel lanes should be minimized to the greatest extent possible.

What constitutes a short crossing distance will vary given the surroundings. In general, 50 ft (15 m) is the longest uninterrupted crossing a pedestrian should encounter at an unsignalized crosswalk.[25]

There are several tools that the designer can employ to minimize crossing distance. One of the simplest is to use a small radius for the corner (see "Radius of the Curb at Corners" on page 225). Use of other tools is discussed below, and specific information about each tool can be found in Table VIII-6.

CURB EXTENSIONS

Curb extensions are one way to reduce the crossing distance for pedestrians. Curb extensions allow pedestrians to move safely beyond a lane of parked cars to a position where they can see and be seen as they begin their crossing.

Curb extensions can also provide an area for accessible transit stops and other pedestrian amenities and street furnishings.

REFUGE ISLANDS

Refuge islands allow pedestrians to cross one segment of the street to a relatively safe location out of the travel lanes, and then continue across the next segment in a separate gap. At unsignalized crosswalks on a two-way street, a median refuge island allows the crossing pedestrian to tackle each

[24] The MUTCD (4C-5) suggests that 60 or more gaps per hour (approximately 60 seconds delay for a pedestrian waiting to cross) is a frequency adequate for pedestrian crossing. However, a study conducted in Boulder, Colorado (Pedestrian Crossing Treatment Warrants, Draft, May 1996, City of Boulder), indicates that pedestrians are willing to wait an average of only 15 seconds before crossing the street. That is, after waiting approximately 15 seconds, most pedestrians will cross in a smaller gap than earlier gaps that were rejected.

[25] The 50 ft (15 m) distance is a rough rule-of-thumb is based on discussions with assorted practitioners. Crossing distance may be reduced for distances less than this.

direction of traffic separately. This can significantly reduce the time a pedestrian must wait for an adequate gap in the traffic stream.

GRADE SEPARATION OF PEDESTRIANS

Because pedestrians tend to cross where it is most convenient, grade-separated crossings are rarely successful where there is any possibility of gaps in the traffic stream that are adequate for crossing at grade.

Use grade-separated crossings only where it is not possible to provide an at-grade facility. Examples include crossing a freeway or major highway, a rail yard, or a waterway. See Table VIII-6 for guidelines on grade-separated crossings.

Crosswalk Pavement Markings

Marked crosswalks indicate to pedestrians the appropriate route across traffic, facilitate crossing by the visually impaired, and remind turning drivers of potential conflicts with pedestrians.

Crosswalk pavement markings should generally be located to align with the Through Pedestrian Zone of the Sidewalk Corridor.

See Table VIII-6 for specific guidelines on the use of pavement markings.

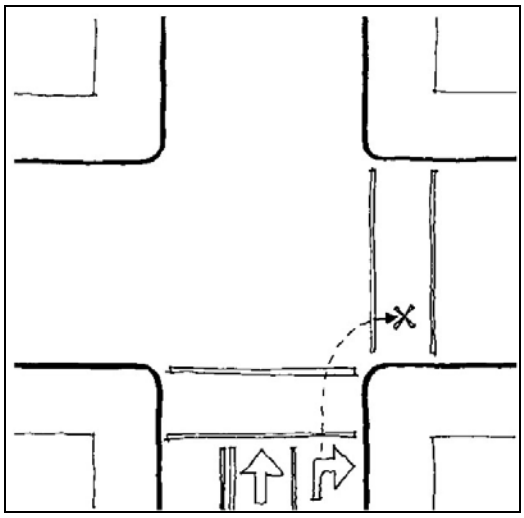
Crosswalks and Traffic Signals

Pedestrian signals should be timed in order to accommodate slower pedestrians crossing within a reasonable amount of time. It is recommended that the calculation of all crossing times be based on a walking speed of no more than 4 ft 6 in (1.22 m) per second. Appropriate timing may be also be achieved by using Pedestrian-User-Friendly-Intelligent (PUFFIN) signals that detect pedestrians in the crosswalk and extend the green time to allow pedestrians to finish their crossing.

Pedestrian push buttons should be located at every actuated signalized intersection, and should be accessible to people in wheelchairs and easy to find for the sight-impaired. They should be located at the level top of the curb-cut ramp and should be approximately 30 in (762 mm) off of ground level. Larger push buttons are preferred to smaller ones. Pedestrian push buttons should not be used at fixed-timed signals where the "walk" signal phase is automatic.

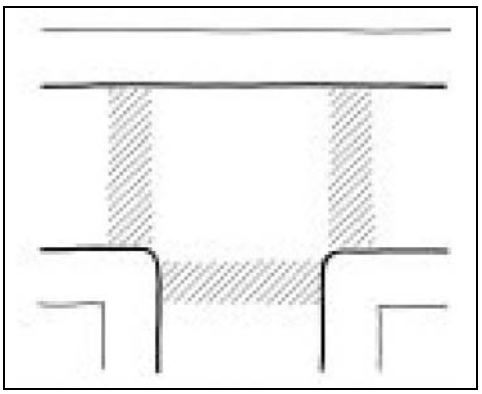
Instructional signage on how to use the push button feature at signalized crossings should accompany these devices.

Audible Pedestrian Signals (APS) should be considered especially in areas frequented by blind people. The signals should be set to emit a lower-volume sound at night and may be quieted adjacent to residential neighborhoods where nighttime activities are low.



The movements of traffic in turn lanes may conflict with pedestrian crossing.

Push buttons should be marked so pedestrians know which signal is activated.



Typical "T" intersection, showing all legal crosswalks.

CONFLICTING MOVEMENTS OF PEDESTRIANS AND VEHICLES AT SIGNALS

Conflicts between vehicle movements and pedestrian movements at signals should be avoided, where possible.

In the case where an arrow signal is used to indicate a mandatory traffic turning movement, the green arrow phase is never actuated at the same time as the walk signal for the adjacent crosswalk across which the traffic will turn.

In other cases, such as at a "T" intersection or a turn-only lane, the traffic may have an ordinary green signal (as opposed to a mandatory arrow), and both the green signal and the walk signal are actuated simultaneously. Motorists are expected to yield to pedestrians in the crosswalk in this situation, but do not always recognize their duty, especially during the pedestrian clearance interval.

A dedicated pedestrian-only phase may be considered to alleviate these potential conflicts, depending on the length of the signal cycle, the traffic impacts, and the relative traffic and transit classifications of the street. This treatment is especially appropriate in High Pedestrian Use areas.

PEDESTRIAN-ONLY SIGNALS

Pedestrian-only traffic control signals are used at mid-block locations, where pedestrian volumes meet the warrants established in the Manual on Uniform Traffic Control Devices (4C-5). Pedestrian-only signals are always pedestrian-activated.

DETECTING PEDESTRIANS AT SIGNALS

Traffic control signals in Santa Barbara generally operate in one of three modes:

Fixed-time signals have a regular cycle of phases with a fixed amount of green time for each movement. There is a regular WALK phase in each direction for each cycle.

Fully-actuated signals use detection of vehicles and pedestrians to actuate all movements through the intersection. These signals are highly responsive to local traffic variations, and tend to be at some distance from other signals.

Semi-actuated signals have vehicle and pedestrian detection only on the side or local street movements (and sometimes for left turns from the arterial street). Both green signal and WALK phases are on for the major street when no other movement requests are detected. These signals tend to be at intersections where the streets are unequal in volume.

In both actuated signal situations, the pedestrian waiting to cross must be detected, either through pedestrian activation (the pedestrian pushes a button to get a WALK phase) or through passive detection (the presence of a waiting pedestrian is sensed through infrared or other types of detectors). Each method is discussed further below.

The most commonly used method of pedestrian detection is the pedestrian push button or call button. The purpose of the pedestrian push button is often misunderstood by pedestrians.

In a few cases, pushing the button means that, within a few seconds, the pedestrian indication will display WALK. However, in most actuated signal conditions, pushing the button means that the WALK will be actuated with the parallel green signal at the next signal cycle, which may mean a wait of up to a minute or more.

The delay that is often experienced in the latter case causes pedestrian confusion. Pedestrians who have pushed the button only to see nothing change for thirty or forty seconds sometimes believe the button is inoperative. Uncertainty about the length of delay is one factor in the perception that push buttons are pedestrian-unfriendly.

There may be technological solutions to the uncertainty problem. One possibility is to have a lighted call button (similar to an elevator call button) to let pedestrians know their request for a walk signal has been received. Such devices are commonly used in Europe, but are not without their technical difficulties.

A lighted call button could also be useful in those locations where the signal is operated in different modes depending on the time of day. In some locations, the call button is only needed during peak hours; at other times the signal operates in a fixed- time mode. In this case, the call button might be lighted at all times when the WALK phase will occur on every cycle.

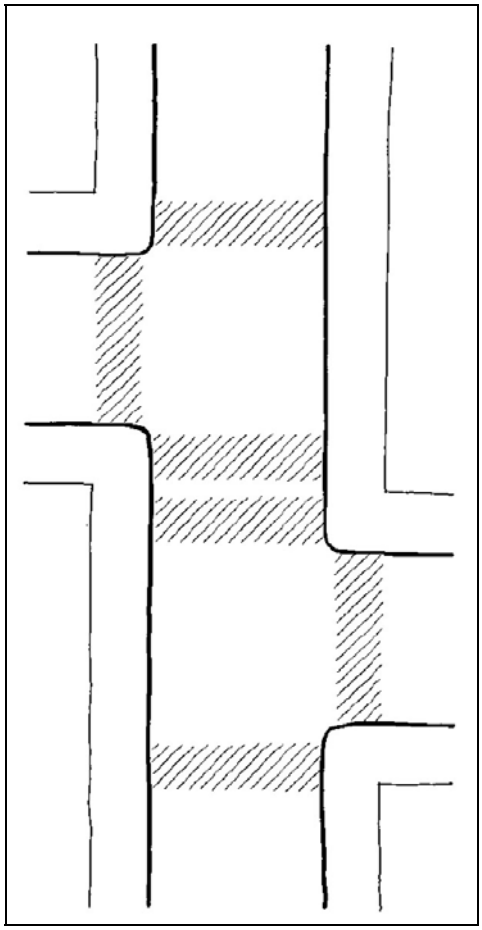
Another possibility for reassuring pedestrians that their call for a walk signal has been received is to install an LED display above the existing pedestrian signal. The display could count down the number of seconds remaining to the WALK signal.

The use of passive detection for pedestrians waiting to cross could help to reduce frustrations for both pedestrians and motorists. The pedestrian needs to take no action in order to get a WALK phase. The passive detector can also sense if the pedestrian crosses in a gap before the WALK is actuated, and cancel the call for WALK, so that traffic is not stopped unnecessarily.

Passive detection may also be useful for detecting pedestrians who need more time to cross. The detection could cause either the WALK or the clearance interval to be extended until a slow-moving pedestrian has completed crossing.

Currently, there is some concern that the passive detector may not detect all waiting pedestrians, or conversely, may be oversensitive and detect "phantom" pedestrians. Passive detection technology is fairly new and is likely to improve in the future.

Crosswalks at "T" and Offset Intersections[26]



Typical offset intersection, showing all legal crosswalks.

This section addresses the special crossing conditions encountered at "T" and offset intersection with guidelines for pavement markings, curb ramps, parking control, pedestrian signals, and reduction of excess crosswalks.

Santa Barbara has many "T" and offset intersections, often occurring along arterial streets on the lines between separately platted additions to the City. Under California traffic code,[27] there are legal crosswalks at these intersections, as indicated in the adjacent illustration, unless crossing is specifically prohibited, or unless some subset of the crosswalks has been designated through the use of pavement markings.

For the crosswalks across the main street at these intersections, one end lands at a conventional corner, while the other end lands on a straight section of sidewalk. When the crosswalk is not marked on the pavement, the non-corner end of the crosswalk may be difficult to distinguish from a mid-block location. In many such existing locations, curb ramps are missing and parking may be permitted across the crosswalk.

It is these crosswalks, with one end landing on the straight section of sidewalk, that are the focus of this section. The crosswalk or crosswalks that parallel the main street are not subject to the guidelines below.

PAVEMENT MARKINGS FOR CROSSWALKS AT "T" AND OFFSET INTERSECTIONS

Use of pavement markings for crosswalks at "T" and offset intersections should follow the general guidelines for the placement of markings as detailed in Table VIII-6, with the recognition that pedestrians may need more guidance at these crosswalks.

If pavement marking is appropriate for a crosswalk where one end lands on a straight section of sidewalk at an unsignalized intersection, a ladder-type marking should be used.

[26] CVC 21361. A local authority with respect to highways under its jurisdiction, shall have the power to designate a single intersection.
[27] CVC 275 (for "T" cross-section)

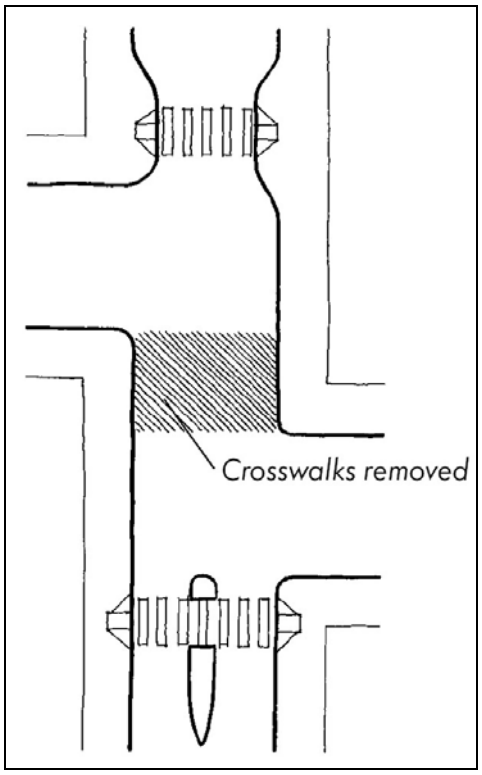
REDUCTION OF EXCESS CROSSWALKS

At offset intersections, or at closely spaced "T" intersections, overall pedestrian safety and convenience may be increased by selectively enhancing some crosswalks while eliminating others.

The adjacent illustration shows an offset intersection where the number of legal crosswalks has been reduced from four to two. In this case, the two crosswalks that remain are enhanced with curb extensions and pavement markings.

In general, enhancement of the outer crosswalks and elimination of the inner crosswalks would be the preferred design at most offset intersections. However, other configurations may be chosen based on the particular site.

The pavement markings alone are enough to eliminate the crosswalks that are not marked, under CVC 21361. The use of "No Pedestrian Crossing" signs is strongly discouraged. However, a sign encouraging pedestrians to use the enhanced crosswalks, "Pedestrians Use Marked Crosswalk," may be used.



Offset intersections with crossing treatments to enhance the outer crosswalk and eliminate the inner ones.

CURB RAMPS AT "T" AND OFFSET CROSSWALKS.

At "T" and offset crosswalks, as at all crosswalks, a curb ramp should be located at each end of each legal crosswalk.

Exception:

> Where curb ramps are installed as part of a project along existing streets with frequent "T" or offset intersections, if the cost of installing a ramp at every crosswalk is out of proportion to the cost of the project, it is acceptable to install curb ramps for one crosswalk of each pair. It is not necessary to prohibit crossing at the parallel crosswalk. For any crosswalk where ramps are not installed, there must be an accessible crosswalk within 100 ft (30 m).

Sign for use where crosswalks are removed by enhancing adjacent crosswalks.

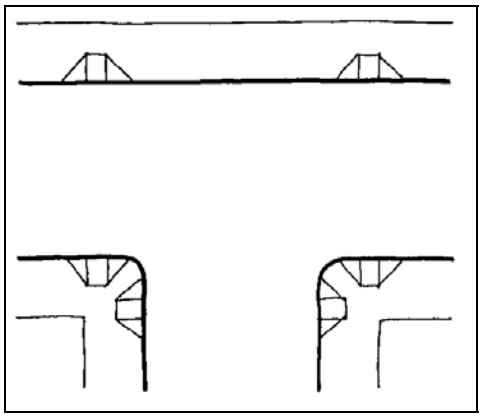
PARKING CONTROL AT "T" AND OFFSET INTERSECTIONS

At "T" and offset intersections, additional attention to the control of parking through signage may be warranted. See Table VIII-6, Parking Control.

PEDESTRIAN SIGNALS AT "T" AND OFFSET CROSSWALKS

At a "T" intersection, all traffic from the "T" street must make a turning movement. There may be a perceived conflict between the turning movements on a green signal and pedestrians crossing on the WALK signal at the same time, although the traffic is required to yield to the pedestrians.

In High Pedestrian Use areas it may be possible to provide a separate pedestrian-only phase as discussed in "Conflicting Movements of Pedestrians and Vehicles at Signals" on page 238.



Curb ramps are located at each end of each crosswalk at a "T"

Crosswalks and Intersection Treatments

There are a number of intersection treatments that may require special attention to crosswalk design. Some of these are discussed below.

RIGHT-TURN SLIP LANES

Right-turn slip lanes are sometimes provided to reduce traffic congestion by allowing the slip lane traffic to bypass a signalized intersection. The slip lane is separated from the originating street by a triangular refuge island, sometimes called a "porkchop."

Right-turn slip lanes are not recommended in areas of high pedestrian use. In general, a standard corner with a small curb radius works better for pedestrians than the slip lane design. However, there are a number of factors that affect how well a given slip lane treatment functions for pedestrians, and these factors are discussed here.

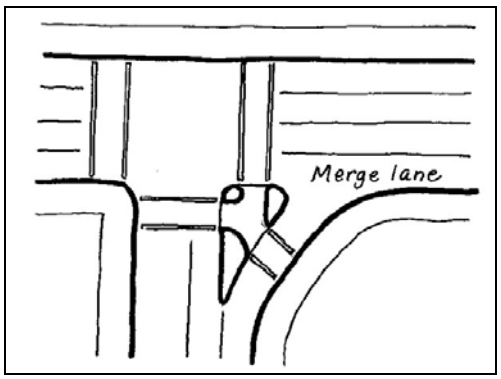
One factor is whether the turning traffic must yield to the cross street traffic or has a dedicated lane to turn into. A slip lane design where turning traffic must yield to the cross street traffic gives a definite advantage to the pedestrian asserting his or her right-of-way in the crosswalk, compared to the dedicated lane design.

Where the turning traffic must yield to the cross street traffic, if the traffic volume on the cross street is low, it is also likely that the turning traffic volume will be low, so there will be gaps for pedestrians to cross. If the traffic volume is high on the cross street, turning traffic will have to stop, creating gaps for pedestrians.

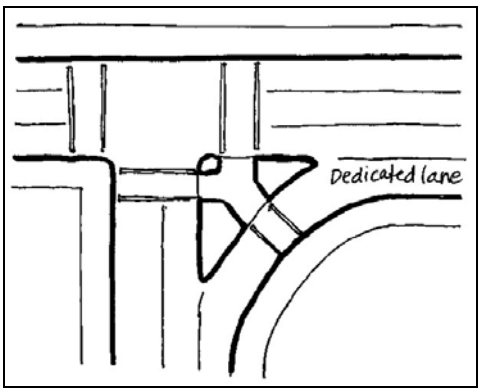
Where the turning traffic moves into a dedicated lane and does not yield to cross traffic, speeds through the slip lane are likely to be higher, there may be inadequate gaps for pedestrian crossing, and drivers are likely to fail to yield to pedestrians.

Where slip lanes are used, it is better from the pedestrian standpoint to design it so that turning vehicles must yield to the cross street traffic.

It is appropriate to use pavement markings to indicate the crosswalk location at a slip lane, since both pedestrians and motorists need guidance as to the correct location
for crossing.



Slip lane where turning traffic must yield to cross traffic.



Slip lane where turning traffic moves into a dedicated lane and does not yield to cross traffic.

MODERN ROUNDABOUTS

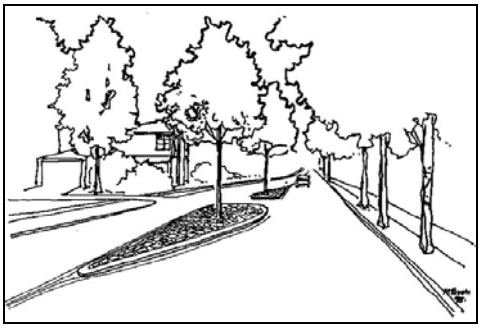
The modern roundabout is an intersection treatment that can have significant traffic operational benefits with certain intersection configurations. Santa Barbara's first roundabout wan installed in 1995 at the five point intersection at Sycamore Canyon and Alameda Padre Serra and another in 1998 at the U.S. Highway Interchange at Milpas Street.

The advantage for pedestrians at roundabouts include shorter crossing distances, less crossing delay , and increased quality of the walking environment (usually with more landscaping). Roundabouts do not assign right-of-way through signals; but rather, rely on vehicles yielding to other vehicles and pedestrians. Some people feel more comfortable having the right-of-way assigned versus stepping out into the street and waiting for a vehicle to yield. Before and after pedestrian studies conducted at the Milpas Roundabout show that pedestrian travel nearly doubled following the roundabout's completion.

Splinter islands act as a refuge for pedestrians crossing traffic at the roundabout located on Milpas Street.

Roundabout design should ensure that pedestrian travel is enhanced with each new installation. Pedestrian crossings should be placed one vehicle length behind the yield line. Crossing distances should be minimized though the use of deflection medians (sometimes called splinter islands), which should serve as pedestrian refuges. Crosswalks should be clearly marked with the use of alternative paving and other highlighting techniques. Special attention should be given to minimize any additional amounts of pedestrian out-of-direction travel and to enhance the quality of the pedestrian environment with landscape and natural materials. Special considerations and cues should be designed for visually impaired pedestrians.

Traffic circle



Slow point

TRAFFIC CIRCLES

Traffic circles are used as traffic calming devices to slow traffic speeds. The circles are typically placed in the center of intersections.

Pavement markings should be used where necessary to indicate offset locations of crosswalks around traffic circles. This may be needed to guide pedestrians away from the vehicle travel path around the circle.

SLOW POINTS

Slow point treatments are used as a traffic calming device to slow traffic speeds by narrowing the travel lanes, usually with a center median. This type of treatment can be installed at a mid-block crosswalk, providing a refuge island for crossing pedestrians.

TRAFFIC DIVERTERS AND STREET CLOSURES

Where traffic diverters or street closures are used for traffic management, pedestrian access needs to be considered and, where possible, should be maintained.

Prohibiting Pedestrian Crossing

Typical intersections should allow pedestrians to cross in all the normal alignments. Prohibiting crossing should be considered only in limited circumstances. See Table VIII-6, Crosswalk Toolbox.

Table VIII-6. Crosswalk Toolbox

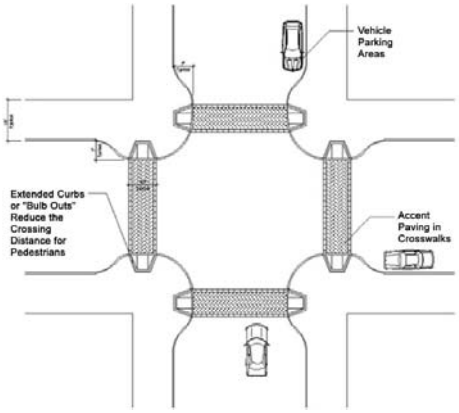
These tools are meant to enhance pedestrian safety by reducing pedestrian exposure time, improving visibility, reducing crossing distance, raising motorist awareness, increasing gap opportunities, and enhancing the overall pedestrian experience. These tools are based on the best available research and experience.

Crosswalk Toolbox		
Advance Stop Bars		
Purpose	To increase pedestrian comfort and safety by stopping motor vehicles well in advance of marked crosswalks, allowing vehicle operators a better line of sight of pedestrians and giving inner lane motor vehicle traffic time to stop for pedestrians. Pedestrians feel more comfortable since motor vehicles are not stopped adjacent to the crosswalk. The multiple threat of motor vehicles is reduced, since vehicles in the inner travel lane have a clearer line of sight to pedestrians entering the sidewalk. Without an advance stop bar, the vehicle in the outer lane may stop for the pedestrian, but the vehicle in the inner lane proceeds, increasing the possibility of a vehicle-pedestrian conflict.	 Advance stop bars alert motorists of pedestrians
Where to Use	– On streets with at least two travel lanes in each direction. – Prior to a marked crosswalk – In one or both directions of motor vehicle travel – Recommended 30 ft. in advance of the crosswalk.	
Guidelines	A “Stop Here for Pedestrians” sign must accompany the advance stop bar.	
Audible Pedestrian Traffic Signals		
Purpose	To provide crossing assistance to pedestrians with vision impairment at signalized intersections	 Speaker on pedestrian traffic signal
Where to Use	To be considered for audible signals, the location must first meet the following basic criteria: – The intersection must already be signalized. – The location must be suitable to the installation of audible signals, in terms of safety, noise level, and neighborhood acceptance. – There must be a demonstrated need for an audible signal device. The need is demonstrated through a user request. – The location must have a unique intersection configuration and characteristics.	
Guidelines	– Audible signals should be activated by a pedestrian signal push button with at least a one second-delay to activate the sound.	

Crosswalk Toolbox

Curb Extension

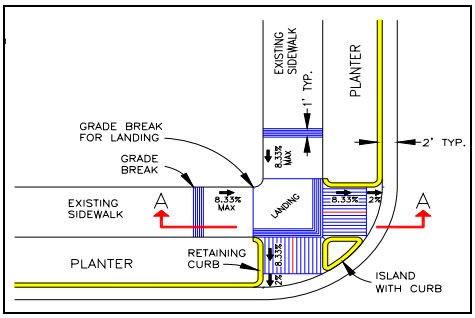
Purpose	To minimize pedestrian exposure during crossing by shortening crossing distance and give pedestrians a better chance to see and be seen before committing to crossing.
Where to Use	Appropriate for any crosswalk where it is desirable to shorten the crossing distance and there is a parking lane adjacent to the curb. (Note that if there is no parking lane, the extensions may be a problem for bicycle travel and truck or bus turning movements.)
Guidelines	– In most cases, the curb extension should be designed to transition between the extended curb and the running curb in the shortest practicable distance. – For purposes of efficient street sweeping, the minimum radius for the reverse curves of the transition is 10 ft (3 m) and the two radii should be balanced to be nearly equal.



Curb extensions

Curb Ramps

Purpose	To make the sidewalk accessible from the roadway level of the crosswalk.
Where to Use	At every intersection location where there is a crosswalk, whether or not the crosswalk is indicated with pavement markings.
Guidelines	See "Guidelines for Street Corners" beginning on page 222.



Curb ramps

Grade-Separated Crossing

Purpose	To completely separate pedestrian travel from vehicular travel
Where to Use	Use only where it is not possible to provide an at-grade facility. Examples include crossing a freeway or major highway, a rail yard, or a waterway.
Guidelines	– The crossing must be accessible. – Grade changes should be minimized to the greatest extent possible. – Shared bicycle/pedestrian facilities should have a clear passage width of at least 12 ft (3.7 m).

Grade-separated undercrossing

Crosswalk Toolbox

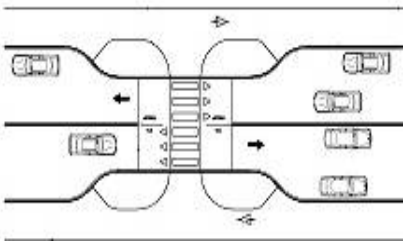
Median Refuge Island

Purpose	To minimize pedestrian exposure during crossing by shortening crossing distance and increasing the number of available gaps for crossing. Helps improve safety by providing a crossing refuge, allowing pedestrians to gauge safe crossing of "one direction" of traffic at a time, and slowing motor vehicle traffic.
Where to Use	Appropriate where the roadway to be crossed is greater than 50 ft (15.2 m) wide or more than four travel lanes; can be used where distance is less to increase available safe gaps. Use at signalized or unsignalized crosswalks.
Guidelines	– The refuge island must be accessible, preferably with an at-grade passage through the island rather than ramps and landings. – A median refuge island should be at least 6 ft (1.8 m) wide between travel lanes and at least 20 ft (6.1 m) long. On streets with speeds higher than 25 mph there should also be double centerline marking, reflectors, and "KEEP RIGHT" signage. – If a refuge island is landscaped, the landscaping should not compromise the visibility of pedestrians crossing in the crosswalk. Tree species should be selected for small diameter trunks and tree branches should be no lower than 14 ft (4.3 m). Shrubs and ground plantings should be no higher than 1 ft 6 in (457 mm). – Refuge islands at intersections should have a median "nose" that gives protection to the crossing pedestrian (see photo).

Median refuge islands

Mid-block Crosswalk

Purpose	To provide a crossing opportunity where there is no intersection.
Where to Use	At mid-block locations, crosswalks are marked where – there is a demand for crossing, and – there are no nearby marked crosswalks.
Guidelines	Mid-block crosswalks are always indicated with pavement markings and warning signs.



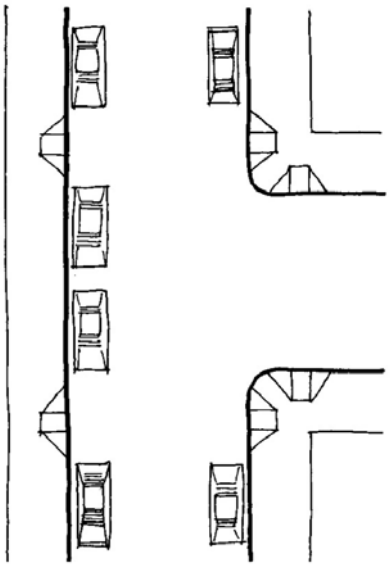
Mid-block crosswalk

Crosswalk Toolbox

No Pedestrian Crossing

Purpose	To avoid conflicts between pedestrians and traffic in situations that are especially dangerous.	 No Pedestrian Crossing sign
Where to Use	Prohibiting crossing should be considered only in very limited circumstances, for example: – where it would be very dangerous for pedestrians to cross, as where visibility (for pedestrians or motorists) is obstructed and the obstruction cannot be reasonably removed – where so many legal crosswalks exist that they begin to conflict with other modes, as on an arterial street with multiple offset or "T" intersections – where there are unique considerations at a particular intersection and pedestrian mobility is not disproportionately affected by the closure	
Guidelines	– Do not close crosswalks at “T” and offset intersections unless there is a safer crosswalk within 30 m (100 ft) of the closed crosswalk – Use "Pedestrians Use Marked Crosswalk" signs for crosswalks closed to reduce an excess of crosswalks on a street with “T” or offset intersections – Use "No Pedestrian Crossing" signs for crosswalks closed for pedestrian safety	

Parking Control

Purpose	To improve visibility in the vicinity of the crosswalk	 In areas with high parking demand, compact parking may be permitted within the intersection, but crosswalks should be kept clear.
Where to Use	Parking is prohibited within all intersections and crosswalks unless otherwise signed. At “T” and offset intersections, where the boundaries of the intersection may not be obvious, this prohibition should be made clear with signage. In areas where there is high parking demand (as determined by the City Traffic Engineer), parking for compact vehicles may be allowed within "T" or offset intersections and on either side of the crosswalk. At these locations, signs will be placed to prohibit parking within the designated crosswalk areas. Parking shall not be allowed within any type of intersection adjacent to schools, school crosswalks, and parks. This includes "T" and offset intersections.	

Crosswalk Toolbox		
Guidelines	Installation of parking signage to allow and/or prohibit parking within any given intersection will occur at the time that the Parking Control section is undertaking work at the intersection.	
Pavement Markings for Crosswalks		
Purpose	To indicate to pedestrians the appropriate route across traffic, to facilitate crossing by the visually impaired, and to remind turning drivers of potential conflicts with pedestrians	 Although many exist, parallel markings are not the preferred way to mark crosswalks.
Where to Use	At signalized intersections, all crosswalks should be marked. At unsignalized intersections, crosswalks should be marked when they – help orient pedestrians in finding their way across a complex intersection, or – help show pedestrians the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts, or – help position pedestrians where they can best be seen by oncoming traffic. At mid-block locations, crosswalks are marked where – there is a demand for crossing, and – there are no nearby marked crosswalks.	

Crosswalk Toolbox		
Guidelines	– Use ladder pavement markings for all crosswalks in Santa Barbara, including school crossings, across arterial streets for pedestrian-only signals, at mid-block crosswalks, and where the crosswalk crosses a street not controlled by signals or stop signs. A ladder pavement marking consists of 2 ft (610 mm) wide bars spaced 3 ft apart and located between 1 ft wide parallel stripes that are 10 ft apart. – Where the Sidewalk Corridor is wider than 12 ft (3.7 m) the crosswalks may be wider than the standard width to match the Sidewalk Corridor. – At mid-block locations, marked crosswalks are always accompanied by signing to warn drivers of the unexpected crosswalk. – The crosswalk should be located to align as closely as possible with the Through Pedestrian Zone of the Sidewalk Corridor. – Where traffic travel lanes are adjacent to the curb, crosswalks should be set back a minimum of 2 ft (610 mm) from the edge of the travel lane. – Pedestrian activated traffic signals can be used in high pedestrian usage areas. – In-pavement flashers may be appropriate on undivided roadways in densely developed areas that do not offer median refuges for crossing pedestrians. This measure should be used at higher risk crossing areas such as mid-block crossings or intersections with high traffic speeds or pedestrian volumes.	

Crosswalk Toolbox		
Pedestrian Push Buttons		
Purpose	To permit the signal controller to detect pedestrians desiring to cross	   Pedestrian push buttons
Where to Use	Used at an actuated or semi-actuated traffic signal at intersections with low pedestrian volumes, and at mid-block crossings	
Guidelines	– When push buttons are used, they should be located so that someone in a wheelchair can reach the button from a level area of the sidewalk without deviating significantly from the natural line of travel into the crosswalk. – The button should be marked (for example, with arrows) so that it is clear which signal is affected. – In general, use of pedestrian push buttons should be avoided in areas of high pedestrian use, such as High Pedestrian Use areas. However, the pedestrian classification must be balanced with the other functions of the street. In High Pedestrian Use areas, there should be a demonstrated benefit for actuated signals before push buttons are installed. The following are some criteria for that benefit: • the main street carries through traffic or transit, such as a major city traffic or transit street, or a district collector • traffic volumes on the side street are considerably lower than on the main street – the pedestrian signal phase is long (for example, on a wide street) and eliminating it when there is no demand would significantly improve the level of service of the main street – Where push buttons must be installed in high pedestrian use areas, designers should consider operating the signal with a regular pedestrian phase during off-peak hours. – Santa Barbara Accessibility Advisory Committee to Staff recommends 30 in (762 mm) height. – U.S. Access Board recommends buttons be raised above or flush with their housing, and large enough for people with visual impairments to see, min. 2 in (51 mm). – U.S. Access Board recommends the force to activate the signals should be no more than 5 lbf (22.2 N).	

Crosswalk Toolbox

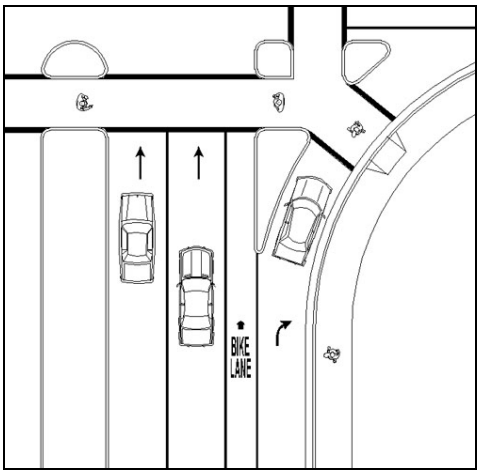
Pedestrian Signal Indication ("Ped Head")

Purpose	To indicate to pedestrians when to cross at a signalized crosswalk
Where to Use	All traffic signals should be equipped with pedestrian signal indications except where pedestrian crossing is prohibited by signage.

Pedestrian signal indication

Porkchop Refuge Island (see Median Refuge Island)

Purpose	To shorten crossing distances and provide a refuge for pedestrians between separated traffic movements
Where to Use	Use with right turn slip lanes, modern roundabouts, or other intersection treatments where pedestrians benefit from a refuge. Can also use at "T" intersections between right-turning and left-turning travel lanes. Note that right-turn slip lanes are not recommended in areas of high pedestrian use.
Guidelines	– Refuge must be accessible. – Crosswalks should be indicated with pavement markings to show pedestrians and motorists the correct crossing location. – Generally, the crosswalk should be set back 20 ft (6.1 m) from the point where the traffic merges, so that pedestrians cross behind the first vehicle, and should be oriented perpendicular to the line of vehicle travel.



Porkchop refuge island

Raised Crosswalk or Raised Intersection

Purpose	To eliminate grade changes from the pedestrian path and give pedestrians greater prominence as they cross the street
Where to Use	Use only in very limited cases where a special emphasis on pedestrians is desired; review on case-by-case basis
Guidelines	– Use detectable warnings at the curb edges to alert vision-impaired pedestrians that they are entering the roadway. – Approaches to the raised crosswalk may be designed to be similar to speed humps, or may be designed so they do not have a slowing effect (for example, on emergency response routes).

Raised crosswalk

Pedestrian Travel in Construction Zones[28]

The City of Santa Barbara should modify its construction specifications for work in City rights-of-way to ensure that pedestrian access is provided, as per the recommendations below.

Alternate Circulation Paths

An alternate circulation path shall be provided whenever the existing *pedestrian access route* in the *public right-of-way* is blocked by construction, alteration, maintenance, or other temporary conditions.

The removal, even for only a short time, of a pedestrian access route, curb ramp, or pedestrian street crossing may severely limit or totally preclude pedestrians, especially those with a disability, from navigating in the public right-of-way. It may also preclude access to buildings, facilities, or sites on adjacent properties. Jurisdictions and their contractors should ensure that an alternate circulation path that can be located visually and audibly is available to pedestrians during construction, parades, and other temporary conditions that block pedestrian passage through the public right-of-way.

LOCATION

The alternate circulation path shall parallel the disrupted pedestrian access route, be located on the same side of the street, and accommodate the disabled. In rare cases where access is not available on the same side of the street, the alternate pedestrian route may be located on the opposite side of the street as long as the distance in excess of the disrupted pedestrian route does not exceed 91.4 m (300 ft), and as long as all requirements of these standards are met.

Example of an unacceptable alternate circulation path with confusing signage.

Photo by Michael Ronkin

A poorly placed alternate circulation path may require an individual to take a lengthy or circuitous route to bypass a site in order to reach a desired destination. The alternate path should be convenient and accessible for all users and should minimize or avoid extra travel distance.

ELEMENTS

The alternate pedestrian route shall include sidewalks and pedestrian access routes, curb ramps, pedestrian crossings, lighting, and all other elements included in these standards.

WIDTH

The alternate pedestrian route shall have a width of 5 ft (1.5 m) minimum, and an additional foot of width for each vertical element along the route (right or left).

[28] from the Final Report Public Rights-of-Way Access Advisory Committee, "New Construction: Minimum Requirements: Temporary Facilities and Construction," January 2001, and Sacramento County's public review draft ADA Transition Plan

ALTERNATE CIRCULATION PATH PROTECTION

The alternate circulation path shall have no protrusions up to a height of 80 in (2 m), including scaffolding and scaffolding braces. Where the alternate circulation path is adjacent to potentially hazardous conditions, the path shall be protected with a barricade consistent with "Barricades," below.

Barricades

Construction sites in or adjacent to the *pedestrian access route* shall be protected with a barricade.

BARRICADE LOCATIONS

Barricades shall be installed in the following locations:

1. Between the pedestrian access route and any adjacent construction site,
2. Between the alternate circulation path and any adjacent construction site,
3. Between the alternate circulation path and the vehicular way, if the alternate circulation path is diverted into the street,
4. Between the alternate circulation path and any protruding objects, drop-offs, or other hazards to pedestrians, and
5. At the down *curb ramp* of an intersection, if the opposite up curb ramp is temporarily and completely blocked, and no adjacent alternative circulation path is provided.

Exception:

> Barricades are not required where the construction site or alternate circulation path is enclosed with a solid, cane-detectable fence or wall. Where protection is provided using a solid fence or wall, a painted or applied horizontal 6 in (150 mm) minimum stripe in 70 percent contrast shall be provided at between 42 in (1065 mm) and 60 in (1525 mm) above the adjacent grade.

BARRICADE SPECIFICATIONS

The alternate pedestrian route shall be protected with a solid barricade to separate an alternate pedestrian route from any adjacent construction, drop-offs, openings or other hazards. Barricades shall be continuous, stable and non-flexible, and shall consist of a solid wall or fence with the bottom or lower rail 1.5 in (38 mm) maximum above the walking surface, and the top of the fence, wall or upper rail 3 ft (914 mm) minimum above the walking surface. Barricades that are covered shall be well-lit. Barricade support members shall not protrude beyond the barricade face into the alternate pedestrian route. Barricades shall be of a contrasting color, with yellow or orange preferred. This standard already is required in the County Design Improvement Standards for Streets, Section 4-24, June 11, 2003.

Construction within or adjacent to the public right-of-way is particularly hazardous to people with visual impairments or mobility impairments if the site is not adequately protected with a barrier or barricade. In particular, people who use canes may not detect a tape or a series of widely spaced traffic cones placed around a construction site. Such markings do not provide sufficient cues to enable a blind pedestrian to anticipate a hazard, nor do they provide an edge along which to travel around an obstruction. Barriers should be detectable, with edge protection and a railing, and be distinguishable, with contrasting graphics for individuals with low vision. Barricades that are supported by "feet," such as inverted "T" supports, can be a tripping hazard if the feet extend too far into the alternate circulation path. Additionally, the barricade is intended to protect individuals with visual and mobility impairments from precipitous drop-offs into construction sites such as trenches. Caution tape does not provide an adequate barricade and cannot be used to delineate the alternate circulation path. The committee discussed the desirability of allowing a barricade that public entities already use for roadway construction in compliance with the Manual on Uniform Traffic Control Devices (MUTCD). However, the primary focus of the markings required here is to ensure the minimum 70 percent contrast is attained so that the barrier will be highly visible to pedestrians.

Construction areas should contain highly visible and detectable barricades.

Photos by Michael Ronkin

Warnings and Signage

When an alternate circulation path or a barricade is created in the *public right-of-way*, a warning shall be provided.

WARNING LOCATIONS

Warning shall be located at both the near side and the far side of the intersection preceding a temporarily completely blocked pedestrian way.

Signs complying with California Building Code Section 1117B.5 shall be provided at both the near side and the far side of the intersection preceding a disrupted pedestrian route, with appropriate wording to guide pedestrians to the alternate pedestrian route. When raised characters or symbols are used, they shall be raised 1/32 in (0.794 mm) minimum and shall be sans-serif uppercase characters accompanied by Grade 2 Braille. Dots shall be 1/10 in (2.54 mm) on centers in each cell with 2/10 in (5.08 mm) space between cells. Dots shall be raised a minimum of 1/40 in (0.635 mm) above the background.

Visually impaired pedestrians cannot be expected to see blocked sidewalks on the far side of the street, or read signs pointing to alternate pedestrian routes.

Guidelines for Transit Stops (Strategy 4.1.5)

Introduction[29]

Pedestrian friendly design encourages transit use. Transit is an integral part of any balanced transportation network. In order to be a successful alternative to the automobile, transit service must be frequent, reliable, convenient, comfortable, and affordable. An effective transit system will not consist solely of a series of stops, but will also integrate complimentary land uses and building design.

The guidelines in this chapter focus on designing and locating transit stops to enhance the convenience and comfort of transit. When designing a transit stop, early coordination with the various approving agencies is crucial. Any transit stop that is located in the public right-of-way will require review and approval by the City Public Works Department, as well as design review approval from either the Architectural Board of Review or the Historic Landmarks Commission. The Metropolitan Transit District (MTD) must also be consulted to ensure that the stops will meet any applicable disabled access regulations and safely serve the different kinds of transit vehicles using the route.

For more information on disabled access regulations, vehicle setbacks, or other transit stop requirements, please refer to the MTD Passenger Accommodations Enhancement Plan.

Location[30]

Assessing appropriate locations for transit stops is an integral part of the development and design review process. Transit stops should be located to maximize convenience, provide pedestrian connections to nearby destinations, and be visible to potential users. Transit stops should not be located away from the public right-of-way where they are not readily visible. The City coordinates with the MTD to identify the most appropriate location for new transit stops or existing stops.

Boarding Surface and Accessibility

A hard flat surface is required for safe boarding, alighting, waiting, and accessibility. A safe boarding surface shall consist of a concrete pad, cement squares, or brick allowing for wheelchair use in all weather. These stops shall be marked with the international accessible symbol on the bus stop sign, and also stenciled with blue paint on the sidewalk to indicate the appropriate boarding position. Not all MTD bus stops are currently accessible because of the lack of a concrete surface or curb cuts. Local jurisdictions or private parties provide funding to make bus stops accessible. The MTD works closely with all parties as well as through the SCTAC (South Coast Transit Advisory Council).

Example bus stop design located on Carrillo Street at Bath Street.

[29] from City of Santa Barbara Urban Design Guidelines: City Grid, 1999.
[30] from City of Santa Barbara Urban Design Guidelines: City Grid, 1999.

Boarding Surface Requirement

1. All MTD bus stops must have a hard flat boarding surface.
2. All stops are to meet ADA requirements.

Boarding Surface Specification

The standard boarding area required for front door access is located at the front of the zone, 6 ft wide by 8 ft deep by 4 in high (1.8 m by 2.4 m by 102 mm). Rear door access requires a minimum area of 14 ft wide by 8 ft deep by 4 in high (4.3 m by 2.4 m by 102 mm), 7 ft (2.1 m) from the end of the front door required area. The bus operator must have an unobstructed view of the rear door exit and therefore in most instances the boarding pad between doors will be continuous equaling 27 ft (8.2 m). See Figure VIII-5.

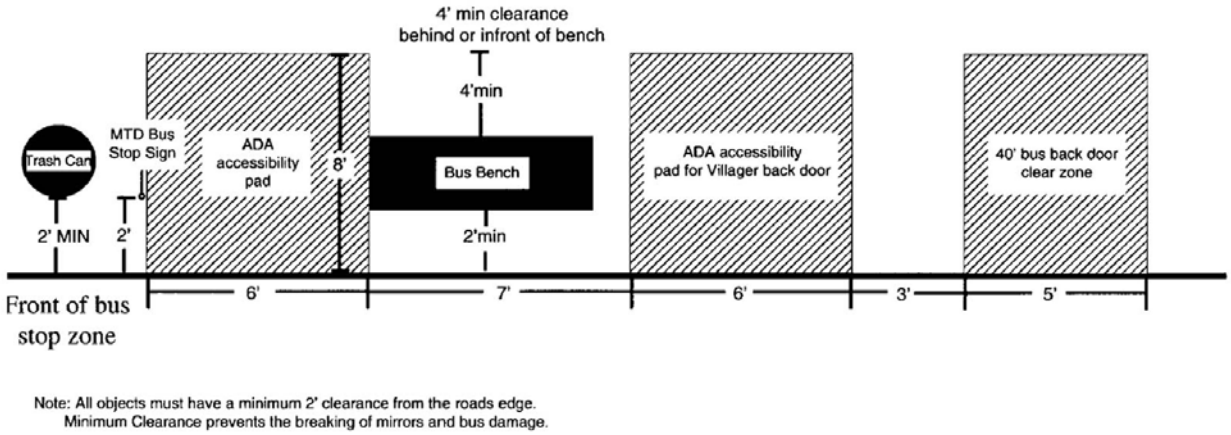


Figure VIII-5. Boarding and Alighting Surface Requirements

Amenities[31]

When designing or improving a transit stop, there are certain amenities that must be provided for the stop to effectively accommodate transit passengers. These amenities are as follows:

- Bus stop markers/signs that are oriented to the pedestrian, rather than to passing vehicles.
- Bus schedule and route map display areas.
- Seating for transit passengers, placed so that waiting passengers are visible to the bus driver.
- A shelter to shield passengers from the weather. An effective shelter can range from a canopy tree that provides shade to an architectural element with a solid top that protects passengers from sun, wind, and rain.
- Pedestrian scale lighting to increase security and visibility for riders and transit operators.
- A trash container.

[31] from City of Santa Barbara Urban Design Guidelines: City Grid, 1999.

- An improved hardscape surface that extends from the curb to the sidewalk. Hardscape surfaces may include paving materials other than poured concrete, as reviewed and approved by the applicable design review board and the Public Works Department. Where bus stops are located in areas without sidewalks, an improved hardscape surface shall be provided for passenger loading and unloading. The surface shall be large enough to accommodate both seated and standing passengers, extend to the street curb, and meet any applicable disabled access regulations. New sidewalk connections from the transit stop to the nearest improved sidewalk(s) shall be provided, whenever possible.

While these amenities should be present at each transit stop, the degree to which they are provided will vary based on several factors. These factors include:

- The space available for the stop
- The location of the stop
- The number of riders expected to use the stop
- The length of time passengers will spend at the stop

For the purposes of these guidelines, transit stops are divided into three general categories, each of which has a list of suggested amenities. These categories can be used as a starting point for the design or upgrading of transit stops. However, the circumstances surrounding each proposed stop will be different, and will need to be evaluated on a case-by-case basis. In addition, space constraints may prevent the inclusion of all the amenities that are called for in the lists below.

Minimalist Stop

This type of stop is designed for minimal passenger use. This stop would generally be located on a route with low ridership (not a transfer point to other routes).

This Minimalist Stop is recognizable to transit passengers, but is not an obtrusive presence on the street. The stop contains the following elements:

- A transit stop sign and route map/schedule display area that are integrated into the design of the lamppost
- A bench
- A canopy tree to provide shelter from the sun
- A trash container
- A decorative hardscape surface

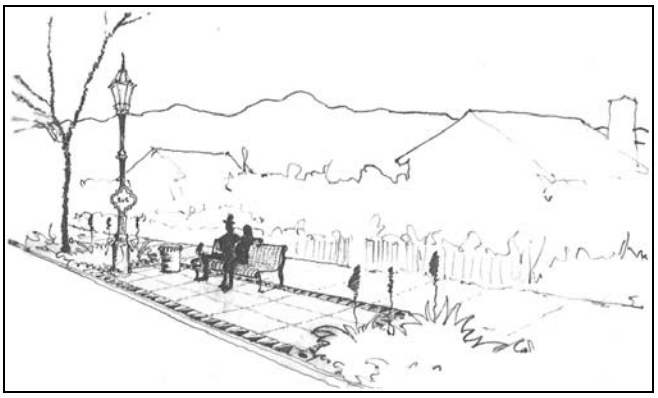


Illustration by Jeff Shelton, Architect

Neighborhood Stop

This type of stop is designed for the higher density residential areas of the grid that surround the Downtown core. This stop would serve an active ridership that would be expected to either transfer buses or complete a portion of its trip on foot. Enhanced amenities, including increased bench space and route maps, are essential at these stops.

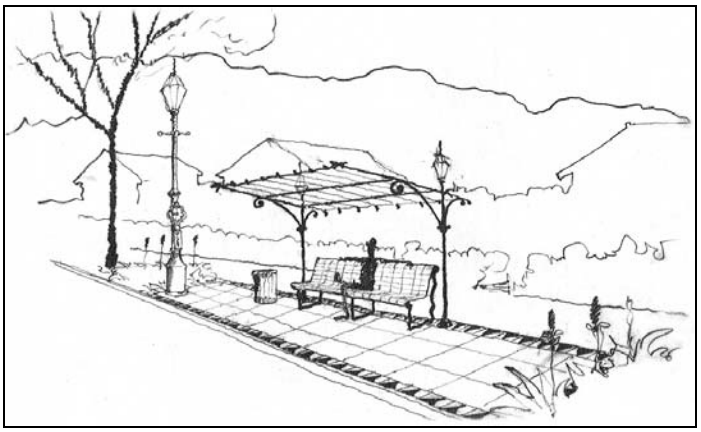


Illustration by Jeff Shelton, Architect

The Neighborhood Stop contains the following elements:

- A transit stop sign and route map/schedule display area that are integrated into the design of the lamppost
- A bench
- A hard top shelter that blends with the surrounding architecture
- A trash container
- A decorative hardscape surface

Commercial Stop

This type of stop, located in the Downtown core, is designed for heavy passenger use by both residents and visitors. The higher volume of riders, the rate of visitor use, and the number of transfer passengers necessitate a high level of pedestrian amenities. Such amenities could include ample seating, increased route and schedule information, a larger sheltered area for passenger waiting, or other amenities listed in this section. Commercial stops should be incorporated into the architecture of existing buildings, wherever possible (see the illustration on the next page).

In addition to the above stops, MTD's South Coast Transit Plan contains a conceptual description of stops called Pavilions. Pavilions would function as intermodal transportation centers within the Downtown core. Pavilions could potentially contain service elements for ticket sales, travel information, ATM machines, and landscaped plazas with benches, drinking fountains, newsstands, and other amenities. Should a Pavilion be proposed in the future, it would be reviewed and developed as a cooperative effort between MTD, City staff, and the appropriate development and design review boards.

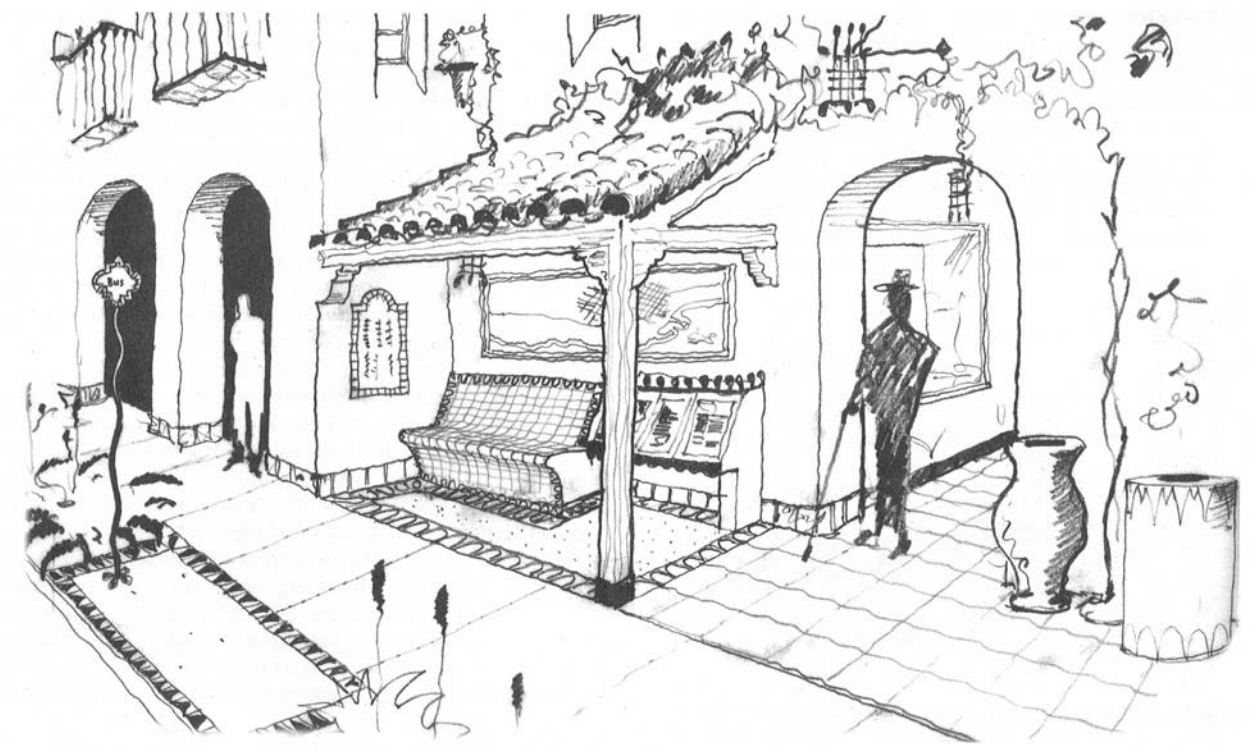


Illustration by Jeff Shelton, Architect

The above example of a Commercial Stop is incorporated into the design of the adjacent building, and contains the following elements:

- A transit stop sign
- Route map and schedule display areas
- Enhanced signage showing nearby destinations/pedestrian amenities
- A bench
- A solid, hard top shelter
- Lighting (incorporated into shelter design)
- A trash container
- A newsrack
- Decorative hardscape surfaces

Consider additional amenities to enhance the utility of transit stops, such as kiosks for information exchange, newsracks, clocks, recycling facilities, bicycle storage facilities (e.g. bicycle lockers), and enhanced signage showing the location of nearby destinations or amenities. The appropriateness of these amenities will depend on many factors, including the location of the transit stop, the level and hours of transit use, the composition of ridership, and the amenities of the transit vehicle (e.g. bicycle racks).

Ensure that transit facilities are designed for disabled access in compliance with the California Building Code.

Glossary

Accessible route – in the ADA, a continuous route on private property that is accessible to persons with disabilities. There must be at least one accessible route linking the public sidewalk to each accessible building. See also "Continuous path."

Actuated signal – a signal where the length of the phases for different traffic movements is adjusted for demand by a signal controller using information from detectors.

ADA – Americans with Disabilities Act of 1990; broad legislation mandating provision of access to employment, services, and the built environment to those with disabilities.

ADAAG – the Americans with Disabilities Act Access Board

Alternative Pathway – a design for a pedestrian facility along a roadway that is an alternative to an urban standard sidewalk with curb.

Attached sidewalk – a sidewalk with one edge adjacent to the back of the street curb. An attached sidewalk may or may not have intermittent planting of street trees in wells along its length.

Audible pedestrian signals – pedestrian signal indicators that provide an audible signal to assist visually impaired pedestrians in crossing the street.

California Vehicle Code – the body of laws which regulate all facets of driving in California.

Clearance interval – the length of time that the DON'T WALK indication is flashing on a pedestrian signal indication.

Connector pathway – a walkway, trail, stair, or other pedestrian facility not situated along a street. This may occur as a pathway within a public right-of-way where no street has been built, in a public walkway easement on private property, or as a path in a park or other open space.

Continuous path – in the ADA, a continuous, unobstructed pedestrian circulation path within a public sidewalk connecting pedestrian areas, elements and facilities in the public right-of-way to accessible routes on adjacent sites. The continuous path is similar to the "Accessible route" on private property, but is subject to different guidelines.

Crossing treatment – a physical treatment of a crosswalk to make it safer and more convenient for pedestrian travel; may include such elements as crosswalk markings, median refuges, or curb extensions.

Cross slope – the slope of the sidewalk across the usual line of travel.

Crosswalk – any portion of a roadway at an intersection or elsewhere that is distinctly indicated for pedestrian crossing. Where there are no pavement markings, there is a crosswalk at each leg of every intersection, defined by law as the prolongation or connection of the lateral lines of the sidewalks.

Cul-de-sac – a street closed at one end.

Curb extension – an area where the sidewalk and curb are extended into the parking lane, usually in order to shorten pedestrian crossing distance. Also called "bulb-out" or "curb bulb."

Curb radius – the length of the radius of the curve where a curb turns a street corner.

Curb ramp – a combined ramp and landing to accomplish a change of level at a curb in order to provide access to pedestrians using wheelchairs.

Curb Zone – the portion of the Sidewalk Corridor that physically separates the sidewalk from the roadway.

Detached sidewalk – a sidewalk that is separated from the curb by a linear planting strip. (see "Separated sidewalk.")

Dropped landing – accessibility element in which the sidewalk ramps down to a landing at street level. Used only in constrained circumstances where a standard curb ramp can't be accommodated.

Fixed-time signal – a signal that operates on a regular fixed cycle and has no actuated phases.

Flare – the sloped transition between the curb and sidewalk that helps prevent pedestrians from tripping over an abrupt change in level.

Frontage Zone – a linear portion of the Sidewalk Corridor, adjacent to the edge of the right-of-way (or property line).

Fully-actuated signal – a signal where all signal phases are actuated. (See "Actuated signal.")

Furnishings Zone – a linear portion of the Sidewalk Corridor, adjacent to the curb that contains elements such as street trees, signal poles, utility poles, street lights, controller boxes, hydrants, traffic signs, street signs, parking signs, parking meters, driveway aprons, planting strip, or street furniture.

Gutter – the trough that runs between the curb or curb ramp and the street.

Grade separation – the separation of a pedestrian facility from facilities for vehicular movement by placing the facilities at different vertical elevations. Examples include pedestrian overpasses and underpasses.

High Pedestrian Use Areas – areas within ¼ to ½ mile of land uses such as commercial, hotel, public facilities, and ocean-front areas that attract high volumes of pedestrian activity.

Intersection – the area of a roadway created when two or more public roadways join together at any angle.

Landing – the level area at the top (or bottom) of a curb ramp.

Local Service Walkway – Local Service Walkways are intended to provide safe and convenient access to local destinations such as residential neighborhoods. All streets and rights-of-way not classified as City Walkways or Pedestrian Districts, with the exception of limited access highways, would be classified as Local Service Walkways.

Low Pedestrian Use Areas – residential neighborhoods and areas outside of Santa Barbara's commercial/retail core which have a lower intensity of pedestrian use.

Median refuge island – a refuge island located between vehicle travel lanes.

Midblock crossing – a crossing treatment that occurs between intersections.

MUTCD – Manual on Uniform Traffic Control Devices, a publication of the Federal Highway Administration that establishes a national standard for traffic control.

Obstruction-free Area – at a street corner, the space between the curb and the lines created by extending the property line (or the line of a public walkway easement) to the curb face, in which no obstructions to pedestrian movement should be located.

Parallel curb ramp – ADA term for the element described in this guide as a "dropped landing," in which the sidewalk ramps down to a landing at street level. Used only where constraints prevent accommodating a standard curb ramp.

Parking control – the use of meters, signs or curb markings to indicate where parking is and is not allowed.

Pathway – a pedestrian walkway other than a standard sidewalk.

Pedestrian – a person afoot; a person operating a pushcart; a person riding on, or pulling a coaster wagon, sled, scooter, tricycle, bicycle with wheels less than 14 inches in diameter, or a similar conveyance, or on roller skates, skateboard, wheelchair or a baby in a carriage.

Pedestrian signal indication – the lighted WALK/DON'T WALK (or walking man/hand) signal that indicates the pedestrian phase.

Perpendicular curb ramp – ADA term for a curb ramp in which the slope of the ramp is generally perpendicular to the line of the curb. This guide uses the term "curb ramp" to refer to such elements. See also "Parallel curb ramp" and "Dropped landing."

Public stair – a public facility of more than three steps, either in public right-of-way or a public walkway easement, for the use of the public.

Public walkway easement – an easement granted by a property owner to the City for the purpose of providing public access to pedestrians. Construction and maintenance of the sidewalk or walkway facilities in the easement is the responsibility of the adjacent property owner, just as it is with walkways in the right-of-way.

Refuge island – a raised island in the roadway that separates a crosswalk into discrete legs and provides a refuge for crossing pedestrians.

Right-of-way – an easement held by the City over land owned by the adjacent property owners that allows the City to exercise control over the surface and above and below the ground of the right-of-way. Property owners are typically responsible for the construction of transportation improvements adjacent to their property. The City maintains the street, while the property owner is responsible for maintaining the sidewalk.

ROW – see "Right-of-way."

Running grade – the slope of the sidewalk or roadway along the line of travel.

Semi-actuated signals – signals where only some phases (usually the side street) are actuated. (See "Actuated signals.")

Separated sidewalk – a sidewalk separated from the curb by linear planting strip which may incluDe lawn or groundcover and street trees. (See "Detached sidewalk.")

Sidewalk – an improved facility intended to provide for pedestrian movement; usually, but not always, located in the public right-of-way adjacent to a roadway. Typically constructed of concrete.

Sidewalk Corridor – the area located within the public right-of-way between the curb line of a street or roadway edge and the property line at the edge of right-of-way.

Slip lane – a lane provided for ease of right-hand turns at the intersection of arterial streets. In new construction, this is often accomplished by the use of a large turning radius and an intermediate refuge island for pedestrian crossings.

Splinter island – used to separate opposing lanes of traffic at the throat of a modern roundabout intersection treatment.

Street vacation – the process of vacating the public right-of-way, the control of which reverts to the underlying property owners unless the City retains a Public Walkway Easement.

Tactile warning – a surface treatment, usually at a curb ramp or any unexpected edge such as a rail platform, that can be detected with a cane by a person with vision impairment.

"T" intersection – an intersection where one street ends at a through street, forming an intersection shaped like the letter "T".

Through Pedestrian Zone – a linear portion of the Sidewalk Corridor which contains no obstructions, openings, or other impediments that would prevent or discourage movement by pedestrians.

Vacation – see "Street Vacation."

Walkway – a pedestrian facility, whether in the public right-of-way or on private property, which is provided for the benefit and use of the public.

Widened shoulder – a pedestrian facility provided immediately adjacent to the roadway.