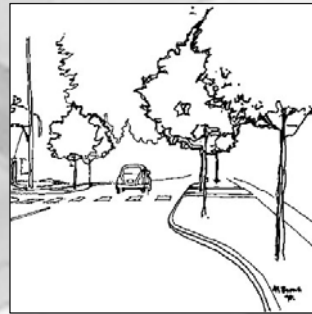
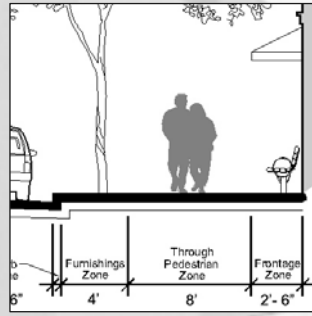


Toolkit for Improving Walkability in Alameda County



Adopted by:

Alameda County Transportation Improvement Authority
September 28, 2006

Alameda County Congestion Management Agency
October 26, 2006

Updated June 2009

Prepared by:



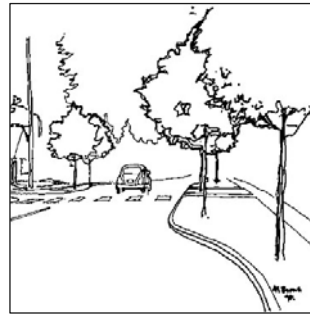
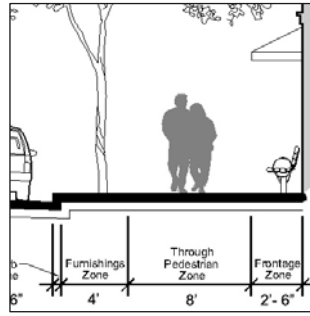
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In association with:

Alta Planning + Design

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This toolkit was developed by ACTIA, in collaboration with the ACCMA. It was produced by Eisen|Letunic, in association with Alta Planning + Design. The Toolkit was updated by Eisen|Letunic, in association with Fehr & Peers.

Please contact ACTIA's Pedestrian and Bicycle Coordinator at (510) 893-3347 with any questions about the Toolkit. The entire Toolkit is available online at www.actia2022.com/bikeped.html.



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Introduction

WHY CARE ABOUT WALKING?

Walking is an integral part of vibrant, livable places. Everyone walks in some form every day as a way to travel from one location to another, either by walking alone or in conjunction with transit, driving or cycling. Environments that encourage walking provide safe, pleasant destinations and easy, convenient access to places people want to go. This toolkit is intended to assist anyone who is working to make his or her local community a safer and more desirable place to walk by providing tools to improve pedestrian safety, convenience and access, and promote walkability in Alameda County.

Walking is the most basic and universal mode of transportation, and comprises a portion of every personal trip. In many cases, a trip can be made solely by walking. Walking is a transportation mode accessible regardless of age or socioeconomic status. Walking is an integral part of most transit trips and can provide health benefits through physical activity.



Walking is a critical component of community health, both in terms of personal health and the health of the environment. Walking for transportation reduces the number of vehicles on the road, resulting in better air quality, which translates into fewer cases of asthma.

Walking for transportation and recreation can help people avoid health problems associated with a sedentary lifestyle, such as obesity, which has been shown to increase the risk of coronary heart disease and diabetes.

Walking has the potential to transcend age, socioeconomic status, geography, race and ethnicity. A safe, accessible pedestrian environment is useful for everyone and beneficial for all communities. However, good pedestrian environments are unlikely to occur without careful planning and design, strong pedestrian-oriented policies, and general community support for walking.

TOOLKIT OVERVIEW

This toolkit is organized into the following chapters:

- Planning and policies that encourage walking
- Innovative pedestrian planning practices
- State-of-the-practice pedestrian facility design based on recent studies and research
- Education, encouragement and enforcement programs shown to promote walking
- Funding opportunities for pedestrian improvements
- Resources with which to improve walkability not found elsewhere in the Toolkit.

Throughout this toolkit, case studies are presented to highlight selected tools, particularly those already at work in Alameda County. This toolkit is designed as a gateway to the wealth of existing, publicly available information about improving pedestrian safety and access. Each topic outlined in the Toolkit includes a link to additional information on the web, or when no web link exists, to other contact information.

This toolkit is intended to facilitate mobility by all pedestrians. Throughout, a “pedestrian” is considered to be a person moving from place to place, on foot or with the use of a mobility device for reasons of physical disability or medical condition.

Introduction

This toolkit was written to be used by many audiences, including public agency staff, pedestrian advocates, community-based organizations, and policy-makers. The material in the Toolkit, while sometimes technical in nature, does not require specialized knowledge to understand.

INTENDED AUDIENCES

Public agency staff

Public agency staff, such as planners, engineers, and public health professionals, can use this toolkit to determine best practices for pedestrian-friendly development and design, and identify innovative policies and programs that foster pedestrian safety and encourage pedestrian activity. While all sections contain information that may be of interest to public agency staff, planners and engineers may be most interested in chapters 1, 2, 3, 5 and 6 and public health professionals may be most interested in chapters 2 and 4.

Pedestrian advocates

Pedestrian advocates may find this toolkit useful to identify innovative solutions to common pedestrian obstacles and existing research about pedestrian activity and its correlations to broader issues of transportation, land use, and public health. Pedestrian advocates may be most interested in chapters 3, 4 and 6.



Other community-based organizations

Community-based organizations can look to this toolkit for information about programs that promote walking; research and studies about the pedestrian environment and public health; and contact information for those practicing pedestrian planning and design in Alameda County. Community-based organizations may be most interested in chapters 4 and 6.

Policy-makers looking for models

Policy-makers can use this toolkit to locate examples of pedestrian-friendly policies, models of good pedestrian design, and links to research about connections between pedestrian activity and transportation, land use, and public health. Policy-makers may be most interested in chapters 3, 4, 5 and 6.

Residents interested in improving the walking environment

All Alameda County residents are pedestrians at some point during their day. For those with an interest in improving the walking environment, this toolkit can help residents contact local pedestrian planners, identify challenges to walking, and develop recommendations for pedestrian improvements where they live—and walk. Residents may be most interested in Sections 3, 4 and 6.

COMPANION COUNTYWIDE PEDESTRIAN PLAN

Although the Toolkit may be used effectively as a stand-alone document, additional detailed information about walking in Alameda County is presented in the companion document, the *Alameda Countywide Strategic Pedestrian Plan*, adopted in 2006 and scheduled to be updated by 2011. The Pedestrian Plan formalizes a 25 year vision for a walkable Alameda County:

Alameda County will be a community that inspires people to walk for everyday trips, recreation and health, where development patterns, connections to transit, and interconnected pedestrian networks offer safe, attractive, and widely accessible walking routes and districts.

The Pedestrian Plan is intended to aid countywide agencies and local jurisdictions by providing the following:

- A snapshot of existing conditions for pedestrians in Alameda County;
- An accounting of the institutional obstacles that hinder improvement of the Alameda County pedestrian environment;
- A vision of what the pedestrian environment in Alameda County could look like in 2030, and goals and strategies for realizing this vision;
- Capital, programmatic and planning priorities for improving Alameda County's pedestrian environment; and

- An analysis of the cost to deliver these investments and the revenue expected to be available to fund them, over the life of the Plan.

TOOLKIT DEVELOPMENT

This toolkit and the *Countywide Strategic Pedestrian Plan* were developed by the Alameda County Transportation Improvement Authority (ACTIA) and adopted by ACTIA and the Alameda County Congestion Management Agency (ACCMA) boards. Both agencies work on funding and implementing countywide transportation projects, plans, and programs. ACTIA administers “Measure B,” Alameda County’s half-cent sales tax dedicated to transportation. Five percent of the sales tax revenue is dedicated to bicycle and pedestrian safety. The ACCMA administers all other countywide transportation funds.

The 2009 *Toolkit* update was a basic update, for the purposes of adding new information about the state of the practice and providing updated web links.

1. Planning and Policies

CHAPTER GUIDE

TOPIC: An overview of the connection between land use and pedestrian activity, and resources to incorporate pedestrian-supportive policies into local plans.

AUDIENCE: Public agency staff, policy makers, pedestrian advocates and community-based organizations.

INTRODUCTION

Arguably the single most important factor in a person's decision whether or not to walk for a given trip is the proximity of their destination. More people walk in communities that are built compactly, with a mix of uses—residential, retail, parks, etc. Infill development and redevelopment provide opportunities to create pedestrian-oriented districts within existing communities. By relieving pressure on a region's "greenfields" – agricultural lands and other areas that have not previously been developed – this type of development may also help protect natural open spaces, resulting in additional places for people to walk, jog and bicycle.

Land use planning, through general and specific plans, sets the stage for walkable communities. Pedestrian master plans establish policies, programs and practices needed to create new walkable communities and enhance areas where walkability was not originally a priority. A related tool for creating an environment that encourages walking is pedestrian safety planning, which strategically addresses deficiencies in pedestrian systems and proactively identifies improvements needed to enhance pedestrian safety, thus encouraging more people to walk.

This chapter presents an overview of a variety of planning practices that can help create walkable

communities. The following chapters focus on specific design elements and complementary efforts and funding mechanisms in support of these plans and policies.

PLANNING FOR PEDESTRIANS

Pedestrian-supportive development emanates from planning policies that consider the needs of pedestrians alongside the needs of motorists, bicyclists, transit users and others. Adopting goals, objectives and policies that aim to increase the safety and availability of pedestrian facilities can provide much needed support for planners, landscape architects, architects, developers, elected officials and others who are attempting to implement pedestrian-supportive development. These policies also serve to ensure pedestrian-friendly design by those who may not otherwise be aware of pedestrian needs. Many Alameda County jurisdictions already include such language in their planning documents.

LAND USES THAT ENCOURAGE WALKING

An appropriate mix of development types and intensities can be one of the most effective and powerful ways to encourage walking. Land use and its effect on the pedestrian environment are discussed in this section.

Mix of uses

Mixing uses can be achieved in many ways:

- **Vertical mixed-use**, for example, ground floor shops with residential above;
- **Horizontal mixed-use**, complementary uses located in very close proximity;
- **Live-work units**, typically condos, townhouses or apartments that include an office or art studio.

Mixed-use neighborhoods should include schools, community centers, professional and health care businesses, grocery stores, and restaurants – in short,

Planning and Policies

places that people frequent on a regular basis. These uses should be connected with pedestrian-friendly facilities, such as wide sidewalks and high-visibility crosswalks. See the *Design Standards* chapter for further discussion of this topic.

Density that supports transit

Beyond the benefit of providing opportunities for short, walkable trips, a sufficient number of residences, shops or offices in a focused area is needed by public transit to attract minimum numbers of passengers needed to support it. For instance, AC Transit recommends 20 residential units per acre around trunkline bus corridors, while BART recommends 40 units per acre or greater around BART stations¹. Some cities, such as Fremont, have established density “thresholds,” which specify the minimum allowable density of new development around transit stations. The Metropolitan Transportation Commission (MTC), the metropolitan planning organization (MPO) for the Bay Area, has also established average density thresholds for transit stations along future transit expansion corridors. (In Alameda County these include BART to Warm Springs/San José, the ferry expansion corridors, and the new AC Transit Bus Rapid Transit corridor along Telegraph Avenue and International Blvd.) These are an average of 3,850 housing units per BART station area, 2,750 housing units per station area along bus rapid transit corridors and 2,200 housing units per station area along commuter rail corridors. These thresholds must be met to be eligible for regional transit expansion program funds.

Proximity to transit

Every transit rider is a pedestrian at some point in their trip, whether they walk from home to transit stop or station, or simply walk across a parking lot to the station entrance. For this reason, pedestrian access is essential to good transit systems. AC Transit’s *Designing with Transit* is a guide to designing and planning for successful transit systems, and includes recommendations for planning land uses and corridors to make transit work better. *Designing with Transit* recommends that communities focus dense, mixed-uses in locations with good transit service, plan bus corridors to maximize their potential for transit-oriented development, and manage parking as part of an overall transportation and land use strategy. See the link below for expanded recommendations from *Designing with Transit*.

¹ AC Transit, *Designing with Transit*, 2004, pp. 3-8.

-
- ▶ AC Transit, *Designing with Transit*
www.actransit.org/pdf/designing_with_transit.pdf
-

LEED-ND CERTIFICATION

The Leadership in Energy and Environmental Design (LEED) for Neighborhood Development (ND) program is a certification program administered by the U.S. Green Building Council. Neighborhood plans rated under the LEED-ND system meet high standards for environmentally responsible, sustainable development. LEED-ND-certified neighborhoods include pedestrian-friendly elements such as:

- Locations that are near existing town and city centers;
- Good transit access;
- Infill locations; and
- Previously developed sites.

More information on the LEED-ND program is available at:

- ▶ USGBC’s LEED-ND Website
www.usgbc.org/DisplayPage.aspx?CMSPageID=148

The MacArthur BART Transit Village is a LEED-ND pilot project and is a local best practice example.

- ▶ MacArthur BART Access Feasibility Study
www.bart.gov/docs/planning/MacArthur_BART_Access_Feasibility_Study.pdf
- ▶ Oakland Redevelopment Agency MacArthur Transit Village
www.oaklandnet.com/government/ceda/revised/planningzoning/MajorProjectsSection/macarthur.html

LAND USE PLANNING AT THE REGIONAL LEVEL

Pedestrian district typology

The Metropolitan Transportation Commission has developed a typology of 12 different pedestrian districts, which captures the types of places that people walk in the Bay Area. The typology is not intended as an exhaustive list, rather it provides examples of pedestrian districts, and describes the elements that are commonly present in each type. The table on the following page, drawn from MTC's *Pedestrian Districts Study*, presents each district type with a short description of its characteristics and at least one Alameda County example.

-
- ▶ Pedestrian Districts Study
www.mtc.ca.gov/planning/bicyclespedestrians/PedDistricts/index.htm
-

Regional smart growth planning

MPOs across California have been and are embarking on regional blueprint planning processes. These public outreach-based plans seek to balance transportation planning with land use planning, housing needs, open space planning, and greenhouse gas reductions to develop a sustainable growth plan for the region. Walkability is always a cornerstone of these plans, both to reduce automobile reliance and to create more vibrant communities.

The Smart Growth Strategy/Regional Livability Footprint Project – the San Francisco Bay Area’s blueprint process – sought ways to accommodate projected growth in a way that would enhance existing communities, reduce mounting traffic congestion by increasing reliance on walking and other non-automobile modes, address the

housing affordability crisis, and preserve open space. The final smart growth strategy for the region – published in 2002 – calls for a “necklace of neighborhoods,” pedestrian-oriented shopping, gathering and living communities along the region’s primary transit lines.

The incentive-based FOCUS project – cosponsored by the four Bay Area regional agencies, the Association of Bay Area Governments (ABAG), the Metropolitan Transportation Commission (MTC), the Bay Area Air Quality Management District (BAAQMD), and the Bay Conservation and Development Commission (BCDC) – seeks to implement the Smart Growth Strategy by encouraging growth in walkable “Priority Development Areas” near transit and within infill areas.

The Sacramento Regional Blueprint Transportation and Land Use Study, adopted in 2005, is a more recent, best practice example of a growth vision focused on walkable, mixed-use, transit-oriented development. This plan formed the basis for Senate Bill SB 375, which now requires similar planning efforts statewide.

-
- ▶ Bay Area Smart Growth Strategy/Regional Livability Footprint Project
www.abag.ca.gov/planning/smartgrowth
 - ▶ FOCUS
www.bayareavision.org
 - ▶ Sacramento Regional Blueprint Study
www.sacregionblueprint.org/sacregionblueprint/home.cfm
 - ▶ SB 375 Summary
<http://gov.ca.gov/fact-sheet/10707/>
-

Pedestrian District Typology

Type of Pedestrian District	Characteristics	Example District
Residential		
Urban Residential	Multi-family, 3-10 stories average, walking distance to commercial districts, light-moderate pedestrian volumes throughout day, commuters and seniors, constrained pedestrian mobility	Southside of Berkeley near UC Berkeley
Pedestrian-Oriented Suburban Residential	Small lot single family, some 2 story attached residential, schools, parks, light pedestrian volumes, diverse pedestrian types including many children, varying sidewalk widths or none	Older neighborhoods in Livermore near downtown
Mixed-Use Nodes or Corridors		
Major Mixed-Use District	Combination of nodes and corridors, up to 6 stories, housing, retail, services, heavy pedestrian volumes all day/evening, constrained pedestrian space, diverse pedestrian types	Oakland’s Uptown Area, near downtown
Transit Village	Node of activity, up to 4 stories, housing retail, services, moderate pedestrian volumes throughout day with commute peaks, diverse pedestrian types	Oakland: Fruitvale BART Station area, Rockridge BART Station area
Large Neighborhood Corridor	On major arterial, 2+ stories, retail, office and services, housing, moderate pedestrian volumes commute and weekend, pedestrian activity geographically spread, diverse pedestrian types	Berkeley: San Pablo Avenue near University Oakland: International Boulevard
Major City Downtown	Node, generally 10+ stories average, many high-rise buildings with some residential, major employers, major retailers, heavy pedestrian volumes with groups created by signals, crossing demand at all locations including mid-block, diverse pedestrian types, pedestrian space can be constrained	Oakland: Downtown
Medium-Sized City Downtown	Node, up to 4 stories average, large employers and office buildings, commercial, moderate pedestrian volumes all day/evening, less weekend activity, constrained pedestrian space, diverse pedestrian types	Berkeley: Downtown
Small Downtown or Local Commercial District	Can be node or corridor, often includes a “main street”, typically 1-2 stories, retail, small offices, service-related, restaurants, light-moderate pedestrian volumes throughout the day, mostly local streets	Alameda: Park Street Livermore: Downtown Pleasanton: Downtown
Institutions and Employment Centers		
Urban Institutional	Major institution or concentration of institutions in urban environment; often educational, civic centers or medical uses, moderate pedestrian volumes, heaviest at commute, may have concentration of slower pedestrians (seniors, disabled)	Oakland: Civic Center
Suburban Employment Center	2+ story average, large office complexes, some light commercial, may be surrounded by traditional business parks, light pedestrian volumes, pedestrian amenities often focused within development on private property	Pleasanton: Hacienda Business Park

GENERAL PLANS

General plan language for pedestrian-supportive development can address many challenges to walking. Best practices for pedestrian-oriented general plans include:

- Moderate to high development densities in the central business district and in mixed-use zones;
- Identified pedestrian nodes, including corresponding pedestrian-oriented policies;
- A complete streets policy (required by AB 1358; see Chapter 2, page 15)
- A transit-first policy; and
- Nonmotorized circulation plans.

The table on the following page shows some issues that can constrain walking and sample goals and policies that can address them. The goals shown are from the *Alameda Countywide Pedestrian Plan*; the policies are excerpted from the general plans of various Bay Area jurisdictions, as noted.

Examples of general plan goals and policies that aim to create more walkable communities in Alameda County can be found via the links below:

-
- ▶ City of Union City
www.ci.union-city.ca.us/pdf_large/general_plan02/transportation%204,%20AG-01-05.pdf
 - ▶ City of San Leandro
www.ci.san-leandro.ca.us/CDGenPlan.asp
 - ▶ City of Fremont
www.fremont.gov/index.aspx?nid=399
-

Many other good examples of pedestrian-supportive policies appear in the general plans of California communities outside Alameda County, including the cities of El Cerrito, Petaluma, and Pasadena.

-
- ▶ City of El Cerrito
www.el-cerrito.org/planning/General_Plan.html
 - ▶ City of Petaluma
<http://cityofpetaluma.net/genplan/reports.html>
 - ▶ City of Pasadena
www.cityofpasadena.net/planning/deptorg/commpln/GenPlan/gp.asp
-

REDEVELOPMENT AND SPECIFIC PLANS

Ensuring that redevelopment plans, neighborhood plans, specific plans and corridor plans have design policies and development standards that encourage pedestrian activity and connections with the surrounding built environment is an important way to improve a city's walking environment. Best practices for accommodating pedestrians in these localized plans include:

- Emphasizing pedestrian-oriented design, walkability and "place-making," the practice of creating unique locations;
- Drawing attention to cultural and historic resources with way-finding and pedestrian facilities and amenities;
- Developing a streetscape master plan to create convenient, comfortable and safe pedestrian environments with district-specific pedestrian features; and
- Using form-based codes that call for pedestrian-scaled building façades, short block lengths and other urban design features that invite walking.

The following focused planning documents provide good examples of related goals and policies.

-
- ▶ Alameda Point Transportation Strategy and Master Plan, Alameda
www.alameda-point.com/pdf/presos/dmp12-19-08.pdf
 - ▶ Downtown Transit-Oriented Development (TOD) Strategy, San Leandro
www.ci.san-leandro.ca.us/CDTODOview.asp
 - ▶ Downtown Master Plan and Zoning Code Update, Benicia, CA
www.opticosdesign.com/downloads/website_downloads/dwtn_code.pdf
 - ▶ Redwood City Downtown Revitalization Strategy and Precise Plan
www.ftscities.com/files/Redwood%20City_Downtown%20Revitalization%20Strategy_v2_screen.pdf
 - ▶ Central Petaluma Specific Plan
<http://cityofpetaluma.net/cdd/pdf/cpsp/cpsp/cpsp-cover-content-intro.pdf>
 - ▶ Market/Octavia Better Neighborhood Plan, San Francisco
www.sfgov.org/site/planning_index.asp?id=25188
-

Sample General Plan Goals and Policies for Pedestrian-Supportive Development

Existing Issues	Sample Goals from <i>Alameda Countywide Pedestrian Plan</i>	Sample Policies from General Plan of Referenced City
<p>AUTO-ORIENTATION</p> <ul style="list-style-type: none"> Few people walking and/or low pedestrian mode share 	<ul style="list-style-type: none"> Number and Percentage of Walk Trips: Increase the number and percentage of walking trips with the intention of reducing motor vehicle use, preserving air quality, and improving public health. 	<ul style="list-style-type: none"> Promote land use concepts that reduce the necessity of driving, encourage public transit use, and reduce trip lengths. These concepts include live-work development, mixed use development, higher densities along public transit corridors, and the provision of commercial services close to residential areas and employment centers. (San Leandro) Require buildings in development centers and neighborhood commercial centers along San Pablo Avenue to be directly abutting sidewalks, with window openings and entries along the pedestrian frontage. (El Cerrito)
<p>SAFETY AND ACCESSIBILITY</p> <ul style="list-style-type: none"> Pedestrian-vehicle collisions and pedestrian right-of-way violations Barriers to pedestrian travel such as highways, railroad crossings and waterways <ul style="list-style-type: none"> Neighborhoods without pedestrian access or sidewalks Inaccessible transit stops 	<ul style="list-style-type: none"> Safety: Improve actual and perceived pedestrian safety and security. Connectivity: Ensure that essential pedestrian destinations throughout Alameda County - particularly public transit stops and stations - have direct, safe and convenient pedestrian access. 	<ul style="list-style-type: none"> Promote bicycle and pedestrian safety and increased use of non-motorized transportation alternatives through engineering, education, and enforcement programs. (Petaluma) Require new development to incorporate design features that make walking more convenient and attractive. Facilities for pedestrians should be provided within new employment areas, shopping destinations, multi-modal transportation facilities and community facilities. (San Leandro) Strive to achieve a more comfortable environment for pedestrians in all areas of San Leandro, with particular emphasis on the BART Station areas, Downtown, and major commercial thoroughfares such as East 14th Street. (San Leandro) Preserve and enhance pedestrian connectivity in existing neighborhoods and require a well connected pedestrian network linking new and existing developments to adjacent land uses. (Petaluma)
<p>DESIGN GUIDANCE</p> <ul style="list-style-type: none"> No pedestrian design guidelines 	<ul style="list-style-type: none"> Infrastructure and Design: Improve Alameda County’s pedestrian environment through additional infrastructure, better design and maintenance. 	<ul style="list-style-type: none"> The City shall develop bicycle and pedestrian design guidelines to be used in the development of all new bicycle and pedestrian facilities. (Union City) Promote the design of streets and buildings that make San Leandro’s streets more attractive and inviting for pedestrians, bicyclists and public transit users. (San Leandro)
<p>INSTITUTIONAL CHALLENGES</p> <ul style="list-style-type: none"> Lack of funding for pedestrian projects Lack of institutional support for pedestrian-oriented development 	<ul style="list-style-type: none"> Funding: Maximize the amount of funding for pedestrian projects, programs and plans in Alameda County, with an emphasis on implementation. Planning & Research: Support 	<ul style="list-style-type: none"> The City shall consider bicycle and pedestrian projects during development of the City’s Capital Investment Plan. (Union City) Consider opportunities for concurrent pedestrian and bicycle improvements whenever improvements to roadways are made. (San Leandro) Utilize a creative variety of measures to fully

Existing Issues	Sample Goals from <i>Alameda Countywide Pedestrian Plan</i>	Sample Policies from General Plan of Referenced City
	<p>planning and research to improve understanding of the benefits of walking, how best to encourage walking, and the need for improved facilities.</p> <ul style="list-style-type: none"> • Staffing and Training: Ensure that public agency staff and elected and appointed officials are well-informed and well-trained in the pedestrian realm. 	<p>implement all projects and programs of the Petaluma Bicycle and Pedestrian Plan. (Petaluma)</p> <ul style="list-style-type: none"> • Develop an interconnected mobility system that allows travel on multiple routes by multiple modes (Petaluma). • Encourage continuing education and training for City staff to create awareness of bicycle and pedestrian needs and of the importance of planning for bicycle and pedestrian travel at the start of the development process. (Petaluma)

LAND USE POLICIES TO AVOID

During the latter half of the twentieth century, many local land use policies in the United States separated new development into single-use zones with the intention of keeping “undesirable” commercial and industrial uses out of residential areas. Auto-oriented shopping malls, tracts of single family home cul-de-sacs, and business and industrial parks were linked with wide arterials of fast-moving traffic. One of the many unintended consequences of this practice is the difficulty that residents have reaching nearby shops, schools, parks and jobs on foot, due both to the large distances that separate them and the uninviting and sometimes unsafe walking facilities that join them. Land use policies that hinder pedestrian safety, convenience and access include:

- **Use-based and single-use zoning** – This traditional approach to zoning segregates land uses, for example separating stores from houses, and diminishes the flexibility with which neighborhoods can develop. By creating larger distances between uses, use-based zoning can result in neighborhoods that are not convenient or inviting to walk in.
- **Low density residential zoning** – Zoning designations for residential areas typically include density requirements, traditionally limiting the number of units per acre that may be constructed. Low residential densities cannot support public transit or neighborhood retail, and often result in neighborhoods where fewer people walk. Although new minimum development density requirements are

attempting to reverse this trend, the tradition of low density development has left a lasting mark on many communities.

- **Residential street layout** – In an attempt to create quiet residential streets, many traditional suburban developments include cul-de-sacs in their street networks. While traffic on these short, dead-end streets is limited to local vehicles, they inadvertently favor driving by greatly increasing distances that must be traveled to reach nearby destinations.
- **Commercial parking requirements** – Zoning for commercial areas can sometimes require high levels of parking with multiple driveways and business entrances located far from the sidewalk. These configurations hinder walking by forcing pedestrians to walk long distances to reach businesses and expose them to potential conflicts with vehicular traffic at driveways and in parking lots.
- **Mega schools** – In an attempt to reserve centrally located sites for revenue-generating development, many suburban builders co-locate new schools on very large sites on the periphery of their communities. This pattern prevents most students from walking or even bicycling to school, both due to the distances that need to be traversed and the automobile traffic generated by parents and students driving to school.

Alternative policies that encourage pedestrian activity can be found in the many notable pedestrian and general plans referenced in this toolkit. *Smart Growth Zoning*

Planning and Policies

Codes: A Resource Guide, produced by the Local Government Commission, is a handbook for the development of smart growth zoning codes, and provides examples of successful codes and advice on drafting smart growth codes (see Glossary for definition of smart growth).

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- ▶ Smart Growth Zoning Codes
www2.lgc.org/bookstore/detail.cfm?itemId=34
-

PEDESTRIAN MASTER PLANS

The most specific and relevant planning effort with respect to pedestrians is the pedestrian master plan. Goals and policies are an essential element of useful pedestrian plans. Effective goals and policies usually incorporate the following elements:

- Pedestrian safety
- Pedestrian access, including accommodations for persons with disabilities
- Streetscape design
- Traffic engineering practices
- Public involvement
- Public health
- Enforcement, encouragement, and education
- Interagency coordination
- Implementation
- Land use
- Sustainability

The following documents provide good local examples of pedestrian plan goals and policies.

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- ▶ City of Oakland Pedestrian Master Plan (2002)
www.oaklandnet.com/government/pedestrian/index.html
 - ▶ City of Berkeley Pedestrian Charter (2004)
www.altaplanning.com/berkeleypedestrianplan/documents/pedcharter.pdf
 - ▶ City of San Leandro Bicycle and Pedestrian Plan (2004)
www.ci.sanleandro.ca.us/england/bikepedmasteplan.pdf
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- ▶ City of Pleasanton's Bicycle and Pedestrian Master Plan (2009)
www.ci.pleasanton.ca.us/services/traffic/traffic-bpac.html
-

Effective pedestrian plans are comprised of elements, chapters or sections that summarize existing conditions and provide design guidance, funding information, and location-specific recommendations for the area covered by the plan. Highly useful and effective pedestrian plans usually include the following elements:

- Introduction, which includes a summary of the plan's purpose;
- Review of existing conditions, which may include a sidewalk and curb ramp inventory, an assessment of existing pedestrian network connectivity, an analysis of pedestrian collisions, and identification of key pedestrian generators and attractors;
- Review of existing planning and policy documents that directly or indirectly impact walking, including general plans, specific plans, transit station area plans, park and recreation plans, and trail plans;
- Analysis of pedestrian needs, focusing on safety;
- Goals, policies and objectives that public agency staff, elected officials, and the public can use to define the vision for the pedestrian environment and guide implementation of the plan;
- Recommended pedestrian education and encouragement programs, including Safe Routes to Schools program guidance;
- Pedestrian design guidelines;
- Crosswalk policy;
- Recommended pedestrian improvements, including a detailed description of each project; and
- Implementation plan, including cost estimates, recommended project phasing, ongoing maintenance needs, and existing and potential funding sources.

Emerging trends being addressed in pedestrian master plans include: the special needs of the growing senior population, safe routes to transit and economic vitality that often accompanies walkable communities. According to the Pedestrian/Bicycle Information Center (PBIC), in addition to Oakland's Plan, some of the most exemplary pedestrian plans in the nation are:

- ▶ San Diego, CA: Planning +Designing for Pedestrians, Model Guidelines for the San Diego Region (2002)
www.sandag.cog.ca.us/uploads/publicationid/publicationid_713_3269.pdf
- ▶ Sacramento, CA: Pedestrian Master Plan (2006)
www.cityofsacramento.org/transportation/dot_media/street_media/sac-ped-plan_9-06.pdf
- ▶ Wisconsin: Pedestrian Policy Plan (2001)
www.dot.wisconsin.gov/projects/state/ped2020.htm
- ▶ Portland, OR: Pedestrian Master Plan (1998)
www.portlandonline.com/transportation/index.cfm?c=37064
- ▶ Madison, WI: Pedestrian Transportation Plan (1997)
www.cityofmadison.com/trafficEngineering/programs/PlanTransportation.cfm
- ▶ Cambridge, MA: Pedestrian Plan (2000)
www.cambridgema.gov/~CDD/et/ped/plan/ped_plan.html
- ▶ Redmond, WA: Transportation Master Plan (2005)
www.redmond.gov/ConnectingRedmond/policiesplans/tmpprojectdocs.asp
- ▶ PBIC’s full “Exemplary Pedestrian Plans” website
www.walkinginfo.org/pp/exem2005.htm

For information on how to fund a pedestrian master plan, see Chapter 5, page 67. For links to model requests for proposals, see Chapter 6, page 76. For pedestrian master plan consultants, see Chapter 6, page 77.

STAFF PEDESTRIAN PLANNERS

A local agency staff planner charged with focusing on pedestrian issues can help a jurisdiction ensure that pedestrian policies are implemented and pedestrian improvements are funded and built. Larger jurisdictions – such as San Francisco – are able to have a dedicated pedestrian planner, while in other jurisdictions, pedestrian planning duties are combined with bicycle and other non-motorized planning, although these modes have different needs. In smaller jurisdictions, or those with limited funding, an existing member of the planning or engineering department staff may fill this role by devoting a percentage of their work time to pedestrian planning efforts. The duties of staff pedestrian planners, whether full- or part-time, often include staffing the jurisdiction’s Pedestrian Advisory

Committee, if one exists, or a joint Bicycle and Pedestrian Advisory Committee.

Pedestrian planning staff may be housed in the planning, engineering or public works departments, depending on the jurisdiction. For example, the City of Berkeley has a full-time bicycle/pedestrian planner in the Public Works Department, with 50 percent of his time devoted to pedestrian and 50 percent to bicycle issues. The City of Oakland employs a Bicycle and Pedestrian Program Manager and a Bicycle and Pedestrian Facilities Coordinator in the Transportation Services Division of the Community and Economic Development Agency. In smaller cities, such as Emeryville, responsibility for pedestrian planning and pedestrian project implementation are divided among several staff members and departments, with staff members spending ten percent (or less) of their time on pedestrian issues. See the *Other Resources* chapter of this toolkit for contact information for staff pedestrian planners throughout Alameda County.

PEDESTRIAN SAFETY PLANNING

A growing focus in many cities is strategic and proactive planning to improve pedestrian safety. Pedestrian safety planning efforts may include:

- Conducting walking audits of pedestrian collision “hot spots” (see Chapter 3 for an example of a walking audit checklist);
- Monitoring and evaluating specific collision locations and patterns and implementing corresponding countermeasures;
- Developing pedestrian safety guidelines, such as a crosswalk policy;
- Developing a pedestrian safety action plan; and
- Participating in a free Pedestrian Safety Assessment from the California Office of Traffic Safety.

Selected pedestrian safety planning resources include:

Planning and Policies

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- ▶ Sacramento’s Pedestrian Safety Guidelines
www.ci.sacramento.ca.us/dsd/development-engineering/documents/Ped_Safety.pdf
 - ▶ Federal Highway Administration’s (FHWA) Guidelines on Developing a Pedestrian Safety Action Plan Course
www.walkinginfo.org/pp/howtoguide2006.pdf
www.walkinginfo.org/training/pdps/
 - ▶ California Pedestrian Safety Assessment Program Brochure and Technical Guide
www.techtransfer.berkeley.edu/pedsafety/
 - ▶ California Center for Physical Activity (walkability audits)
www.caphysicalactivity.org/wcw.html
-
- ▶ Alameda County pedestrian collision mapping
www.tsc.berkeley.edu/research/geocodingcrashdata.html#july2009
 - ▶ Alameda County Public Health Department Planning for Healthy Communities
www.acphd.org/user/services/AtoZ_PrgDtls.asp?PrgId=92
-

Collision analysis

Data from the California Highway Patrol’s Statewide Integrated Traffic Records Systems (SWITRS) can be used to identify high-priority locations for pedestrian improvements. These analyses can either be statistical (to identify city-wide issues, for instance) or spatial (to zero in on issues at a particular location) or a combination of both.

Once SWITRS data has been collected, it can be analyzed and/or mapped to identify commonalities between incidents, frequency, location and more. The Metropolitan Transportation Commission has developed a detailed summary of collision analysis tools. The Washington State Department of Health provides guidelines on mapping data, including collision records, in GIS (geographic mapping systems).

In Alameda County, the County’s Public Health Department and U.C. Berkeley’s Traffic Safety Center have both mapped all pedestrian collisions in the county over multiple years, and both make these GIS files available to local jurisdictions upon request.

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- ▶ CHP Information Services Unit for SWITRS data
Tel: 916-375-2849
www.chp.ca.gov/index.html
 - ▶ MTC’s Safety Analysis summary
www.mtc.ca.gov/planning/bicyclespedestrians/safety/analysis.htm
 - ▶ Washington State Mapping Guidelines
www.doh.wa.gov/Data/guidelines/Geocodeguide.htm
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2. Pedestrian-Oriented and (Dis)oriented Practices

CHAPTER GUIDE

TOPIC: Provides an overview of practices and policies outside the realm of pedestrian planning that, nonetheless, can have a significant impact on walkability.

AUDIENCE: Intended for all Toolkit users, but especially helpful for public agency planners, engineers, public health professionals, and policy-makers.

In addition to land use and pedestrian plans that directly affect the pedestrian environment, many practices in a jurisdiction have the capacity to improve or degrade walkability. This chapter explores pedestrian-oriented opportunities within common jurisdictional practices, as well as polices and practices to avoid.

COMPLETE STREETS

Federal, state and regional agencies have adopted specific policies supporting or requiring that pedestrian needs be addressed in all phases of building transportation facilities. This is often referred to as “complete streets” or “routine accommodation” and is also applied to the needs of bicyclists and people with disabilities.

United States Code (Title 23 U.S.C. §217) requires that pedestrians be given due consideration in the planning process and in construction and reconstruction of transportation facilities. Further information regarding this code section may be found using the link below.

► United States Code

www.fhwa.dot.gov/environment/bikeped/sec217.htm

In addition, the US Department of Transportation adopted a policy statement in 2001 on “Integrating Bicycling and Walking into Transportation Infrastructure: Design Guidance.” The policy states that “bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist.”

► “Integrating Bicycling and Walking into Transportation Infrastructure: Design Guidance”

www.fhwa.dot.gov/environment/bikeped/design.htm

The California Vehicle Code (CVC) Section 21949 also states that:

(a) The Legislature hereby finds and declares that it is the policy of the State of California that safe and convenient pedestrian travel and access, whether by foot, wheelchair, walker, or stroller, be provided to the residents of the state.

(b) In accordance with the policy declared under subdivision (a), it is the intent of the Legislature that all levels of government in the state, particularly the Department of Transportation, work to provide convenient and safe passage for pedestrians on and across all streets and highways, increase levels of walking and pedestrian travel, and reduce pedestrian fatalities and injuries.

The California Complete Streets Act of 2008 requires that cities and counties include complete streets policies as part of their general plans. Under these policies,

Pedestrian-Oriented Practices

roadways must be designed to accommodate all modes of users and users of all abilities (see Complete Streets section of Chapter 3 for more information on complete streets).

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- ▶ Assembly Bill 1358 (2008; Leno)
www.leginfo.ca.gov/pub/07-08/bill/asm/ab_1351-1400/ab_1358_bill_20080930_chaptered.pdf
-

The California Department of Transportation's Deputy Directive 64: Accommodating Non-Motorized Travel (DD-64) – which became effective in 2001 and was updated in 2008 – outlines the agency's policy regarding non-motorized travel:

The Department develops integrated multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian, and transit travel is facilitated by creating "complete streets" beginning early in system planning and continuing through project delivery and maintenance operations.

The directive applies to all Caltrans employees who are involved in the planning, design, construction, maintenance and operations of the transportation system. This directive codifies the Department's treatment of the needs of pedestrians within the transportation system, resulting in a multi-modal approach to transportation planning and design throughout California.

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- ▶ Caltrans Complete Streets policy
<http://www.calbike.org/pdfs/DD-64-R1.pdf>
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In 2006, the Metropolitan Transportation Commission adopted the Regional Policy for the Accommodation of Non-Motorized Travelers, which is intended to cover the planning, design, funding and construction phases of all regionally funded transportation projects. The Policy states:

Projects funded all or in part with regional funds (e.g. federal, STIP, bridge tolls) shall consider the accommodation of non-motorized travelers, as described in Caltrans Deputy Directive 64. These recommendations shall not replace locally adopted policies regarding transportation planning, design,

and construction. These recommendations are intended to facilitate the accommodation of pedestrians, bicyclists, and disabled traveler needs into all projects where non-motorized travel is consistent with current, adopted regional and local plans. In the absence of such plans, federal, state, and local standards and guidelines should be used to determine appropriate accommodations.

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- ▶ MTC's Routine Accommodation Policy
www.mtc.ca.gov/planning/bicyclespedestrians/regional.htm#accommodation
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EVALUATING TRANSPORTATION IMPACTS OF NEW DEVELOPMENT

Transportation impact analyses are used to project future impacts on transportation systems of proposed development or new land use scenarios. Traditionally, transportation impact analyses have focused on the role of motor vehicle transportation, overlooking pedestrians and other non-motorized transportation users and the effects of motor vehicle traffic on pedestrian activity. New efforts to encourage complete streets have resulted in a more multi-modal approach (see discussion of designing for complete streets in the following chapter). The Oregon Department of Transportation and the Federal Highway Administration (FHWA) publish a best practices methodology for transportation impact analyses, available at the link below.

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- ▶ Best Practices for Traffic Impact Studies
www.oregon.gov/ODOT/TD/TP_RES/docs/Reports/BestPracticesforTraffic.pdf
-

San Francisco has developed city-specific, multi-modal transportation impact guidelines that recognize the unique travel options and patterns in San Francisco that make conventional impact analysis tools inappropriate. Specifically for larger projects, the guidelines require the following pedestrian-specific analyses:

- Pedestrian trips generated by the project must be estimated for the PM peak hour, the peak pedestrian activity period for the immediate area (often mid-day), and/or the project's peak period of trip generation.

- Pedestrian level of service conditions must be based on either sidewalk crowding or crosswalk delay methodologies, whichever is more appropriate for the context.
- Pedestrian safety must be assessed, including potential conflicts between pedestrians and vehicles created by the project (such as driveways) or by proposed changes to the public right-of-way (such as modified sidewalks or streets).
- Pedestrian access to the project by the disabled must be qualitatively discussed.

Multimodal LOS

The CEQA statute and the California Resources Agency's State CEQA guidelines offer criteria for determining when a proposed project requires environmental review, and steps to follow in determining whether a project has a significant effect on the environment.² The CEQA Environmental Checklist Form (Appendix G of the CEQA Guidelines) identifies the following thresholds of significance for Transportation/Traffic issues:

- Would the project cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e. result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion and intersections)?
- Would the project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?
- Would the project conflict with adopted policies or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

Within this framework, cities set their own screening criteria, thresholds of significance, and methodologies to determine the expected impacts of a proposed project, as well as what actions may be taken to mitigate significant environmental impacts. For traffic and circulation

² State Senate Bill 97 requires the development of amendments to CEQA guidelines for the mitigation of greenhouse gas emissions or the effects of these emissions by January 2010. The development of these amendments was underway when the updated *Toolkit* went to press.

impacts, many local jurisdictions have established specific quantitative thresholds of significance, based on the intersection Level of Service (LOS) methodology (see box).

These thresholds identify a specific LOS at or below which a proposed project will be considered to have a significant environmental impact related to transportation. For example, under the City of Oakland's CEQA thresholds, the following would be considered significant environmental impacts:

- At a signalized intersection which is located outside the Downtown area, the project would cause the LOS to degrade to worse than LOS D (i.e., E);
- At a signalized intersection which is located within the Downtown area, the project would cause the LOS to degrade to worse than LOS E (i.e., F).

LEVEL OF SERVICE

Level of Service (LOS) is a traditional traffic engineering methodology that describes how much delay motor vehicles experience at key intersections. According to common CEQA interpretation, proposed development or transportation projects that are projected to degrade motor vehicle LOS beyond a certain level must be mitigated to maintain LOS at current or improved levels. However, many of these mitigations – such as free right turn lanes and additional travel lanes – degrade the travel environment for transit users, bicyclists and pedestrians.

Because LOS is related to delay at intersections, mitigating LOS-related traffic impacts normally involves adding intersection capacity. This may include striping additional travel lanes or turning lanes, adding dedicated right turn pockets, adding right-turn signal arrows, or creating free right turn lanes. While these types of improvements can preserve motor vehicle LOS and decrease delay, they often do so at the expense of pedestrians and often bicycles and transit as well. Adding additional lanes increases pedestrians' exposure to collision. Adding right turn signals or free right turn lanes place pedestrians in potential conflict with high-speed turning vehicles. Because other modes – including walking – lack their own well-defined set of thresholds or service levels, motor vehicle LOS is used as the primary

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basis for the transportation-related environmental impact determination under CEQA, and autos continue to be the “incumbent” mode.



The concept of multi-modal level of service calls for developing LOS measures for all modes and a methodology to simultaneously consider the impact of development and transportation projects on all modes. Multi-modal LOS is an emerging practice and has not been standardized on a nationwide level in the manner that traditional level of service analysis has. A National Cooperative Highway Research Program project, completed in 2007, developed a methodology for evaluating the multimodal level of service (MMLOS) of various urban street designs and operations. This method can be used for evaluating “complete streets,” context-sensitive design alternatives and smart growth from the perspectives of all street-users. Transportation analysts can use this method to evaluate the tradeoffs of various street designs in terms of their effects on the perception of quality of service of auto drivers, transit passengers, bicyclists, and pedestrians.

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- ▶ National Cooperative Highway Research Program (NCHRP) Report 616: Multimodal Level of Service Analysis for Urban Streets
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_616.pdf
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The City of Alameda’s Transportation Commission recommended the development of multi-modal LOS standards as a policy in their Transportation Master Plan. The City completed an update to the General Plan Transportation Element in March 2009, which includes the following policies regarding multimodal LOS:

- Policy 4.1.2.a Develop multimodal level of service (LOS) standards that development will be required to maintain by encouraging the use of non-automotive modes.
- Policy 4.1.2.b Monitor the multimodal level of service at major intersections to identify priorities for improvement.

The implementation method for this policy is still being developed.

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- ▶ City of Alameda Transportation Master Plan
www.ci.alameda.ca.us/tmp
-

The City of San Francisco requires the calculation of pedestrian LOS (based on sidewalk crowding) for all CEQA documents in the city. Many other cities have stringent significance criteria that, while not requiring a calculation of pedestrian LOS, require that pedestrian impacts be considered equal to (or stronger) than automobile LOS impacts. In the City of Petaluma, if road widening will decrease pedestrian accessibility or safety, the project is prohibited, even if calculations show it as a mitigation to improve automobile LOS. In the City of San José, automobile LOS has been removed as a CEQA significance criteria for the downtown area, illustrating the flexibility cities have to insist on pedestrian-friendly practices, while complying with CEQA.

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- ▶ San Francisco County Transportation Authority’s Multi-modal Impact Criteria
www.sfcta.org/images/stories/Planning/CongestionManagementPlan/2007%20-%20appendix%2005%20-%20tia.pdf
 - ▶ City of Petaluma General Plan
<http://cityofpetaluma.net/genplan/reports.html>
 - ▶ City of San José Traffic Impact Analysis Handbook (areas within the downtown core are exempt from the citywide LOS D threshold)
www.sanjoseca.gov/planning/eir/traffic_impact_analysis/Vol%201%20San%20Jose%20TIA%20Guidelines%20008.pdf
-

The San Francisco County Transportation Authority’s *Strategic Analysis Report* discusses how the City’s existing CEQA thresholds “favor preserving auto levels of service at the expense of improving transit, bicycle and pedestrian conditions.” The study recommends defining

LOS standards for all modes, so that conditions can be evaluated consistently and improvements to the auto mode will not result in degradation to other modes. The report discusses a number of alternative LOS methodologies that could be implemented by the City's Planning Department as part of the standard CEQA analysis.

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- ▶ Strategic Analysis Report 02-03 on Transportation System Level of Service Methodologies
www.sfcta.org/images/stories/legacy/documents/FinancialSAR02-3LOS_Methods_000.pdf
-

Other cities, such as Seattle, Charlotte, NC, and Fort Collins, CO, have also adopted multi-modal LOS methodologies, which take a comprehensive look at pedestrian impacts, focusing on connectivity to major destinations and the conditions of pedestrian facilities.

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- ▶ City of Seattle Traffic Demand Model
www.cityofseattle.net/transportation/transitnetwork.htm
 - ▶ City of Alameda Multi-Modal Circulation Plan
www.ci.alameda.ca.us/tmp/mm_circ_plan.html
 - ▶ Fort Collins, Colorado's Multi-Modal Level of Service Manual
www.co.larimer.co.us/engineering/GMARdStds/Appendix2010-01-02.pdf
 - ▶ Charlotte, North Carolina's Urban Street Design Guidelines
www.charmeck.org/Departments/Transportation/Urban+Street+Design+Guidelines.htm
-

Trip generation rates

Traffic volumes forecast for a particular development, a key input in LOS analyses, are typically based on the Institute of Transportation Engineers' (ITE) published trip generation rates. However, ITE rates typically reflect isolated suburban development that lacks transit service and has inadequate pedestrian and bicycle facilities. Thus, they may not be appropriate for more urban or pedestrian-oriented contexts. ITE does not provide trip generation rates for non-auto modes. ITE has a goal of developing a stand-alone pedestrian trip generation manual in the future.

The Association of Bay Area Governments (ABAG) is leading a Caltrans-funded Urban Infill/Trip Generation study to produce new trip generation data for urban infill locations that can be adopted by the Institute of Traffic Engineers (ITE). Phase I of this effort, completed in 2008, included an extensive research effort, with a new methodology tested for 13 pilot sites. A second phase, with an additional 10 pilot sites, is underway.

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- ▶ Trip-Generation Rates for Urban Infill Land Uses in California Phase 1: Data Collection Methodology and Pilot Application - Final Report (2008)
www.dot.ca.gov/newtech/researchreports/reports/2008/ca_infill_trip_rates-phase_1_final_report_appendices_4-24-08.pdf
-

COUNTING PEDESTRIANS

The National Bicycle and Pedestrian Documentation Project – co-sponsored by Alta Planning and Design and the ITE Pedestrian and Bicycle Council – is a nationwide effort to provide a consistent model of data collection and ongoing data for use by planners, governments, and bicycle and pedestrian professionals.

Meanwhile, the Metropolitan Transportation Commission has published the *Handbook for Bicyclist and Pedestrian Counts*, which presents best practices to better-prioritize intervention measures aimed at reducing pedestrian/vehicle collisions.

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- ▶ MTC Handbook for Bicyclist and Pedestrian Counts
www.mtc.ca.gov/services/arterial_operations/downloads/ped-bike/Handbook_Summary.pdf
 - ▶ National Bicycle & Pedestrian Documentation Project
<http://bikepeddocumentation.org>
-

WALKING AND PUBLIC HEALTH

A significant amount of research regarding the relationship between walking and public health has been published and is now available. Notable articles, such as "Many Pathways from Land Use to Health: Associations between Neighborhood Walkability" and "Active Transportation, Body Mass Index and Air Quality," published in the *Journal of the American Planning Association* in 2006, document links between a

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neighborhood's walkability and the health of its residents.

A 2008 article in the Journal of Physical Activity and Health, "Walking, Cycling, and Obesity Rates in Europe, North America, and Australia," found that countries with the highest levels of active transportation generally had the lowest obesity rates.

In 2009, the American Academy of Pediatrics released a statement highlighting how a community's built environment affects children's opportunities for physical activity. The statement expresses support for neighborhoods and communities that provide opportunities for recreational physical activity with parks and open spaces, and especially programs that encourage walking and biking to school.

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- ▶ Journal of the American Planning Association articles www.act-trans.ubc.ca/documents/Franketal_JAPA_06.pdf
 - ▶ Walking, Cycling, and Obesity Rates in Europe, North America, and Australia <http://policy.rutgers.edu/faculty/pucher/JPAH08.pdf>
 - ▶ American Academy of Pediatrics Statement on the Built Environment <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;123/6/1591>
-

Other studies on the relationship between walking and public health include the following:

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- ▶ Barbara A. McCann & Reid Ewing. "Measuring the Health Effects of Sprawl: A National Analysis," 2003. www.smartgrowthamerica.org/report/HealthSprawl8_03.pdf
 - ▶ Pucher and Dijkstra. "Promoting Safe Walking and Cycling to Improve Public Health: Lessons from The Netherlands and Germany," American Journal of Public Health. 2003; 93: 1509-1516. www.policy.rutgers.edu/vtc/documents/Articles.Promote_safe_walking-Pucher_ajph.pdf
 - ▶ Frank LD, Engelke P. "How land use and transportation systems impact public health: a literature review of the relationship between physical activity and built form," ACES: Active Community Environments Initiative Working Paper #1, 2000 www.greenway.org/pdf/landuse_and_health.pdf
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- ▶ Pedestrian and Bicycle Information Center links to additional information on the connection between walking and public health www.walkinginfo.org/why/benefits_health.cfm
 - ▶ Active Living by Design presentations from the Robert Wood Johnson Foundation www.walkinginfo.org/library/details.cfm?id=4357
-

Health Impact Assessments

The purpose of a Health Impact Assessment (HIA) is to identify programs and policies that are likely to have major impacts on the health of a population, with the goal of reducing harmful effects and increasing health benefits. HIAs can be applied to a broad range of actions ranging from economic policies to social programs, and can also be used to evaluate how changes to the built environment, such as a transportation project, will affect public health.

The San Francisco Department of Public Health's Program on Health, Equity and Sustainability (PHES) uses the Pedestrian Environmental Quality Index (PEQI), a GIS map-based analysis tool, to quantify pedestrian-specific health benefits and disbenefits during HIAs. The PEQI is an observational survey that assesses five categories: traffic, street design, land use, intersections, and safety to quantify a neighborhood's walkability. The factors are evaluated based on empirical studies from numerous cities.

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- ▶ San Francisco Department of Public Health Pedestrian Quality Index www.sfpbes.org/HIA_Tools/PEQI.pdf
-

Other HIA resources include:

-
- ▶ UCLA Health Impact Assessment group www.ph.ucla.edu/hs/health-impact/
 - ▶ UC Berkeley's Center for Occupational and Environmental Health <http://coeh.berkeley.edu/>
-

TRANSPORTATION DEMAND MANAGEMENT AND PARKING POLICIES

Transportation Demand Management (TDM) programs encourage travel by alternative modes by incentivizing non-auto options, including transit, bicycling and walking. Beyond shoe leather, walking does not have a cost, unlike other modes; however, TDM can encourage walking to work with parking cash-out programs (paying employees not to use a parking space) and discounts to nearby businesses and services. In fact, in mixed-use, higher density, and/or transit-oriented employment centers, any TDM measure that discourages driving to work also prevents midday auto use, thus serving to encourage walking to lunch and errands.

Example Plans and Ordinances:

- ▶ City of San Francisco Commuter Benefits Ordinance www.commuterbenefits.org/
- ▶ Redwood City Parking Management Plan <http://shoup.bol.ucla.edu/Downtown%20Redwood%20City%20Parking%20Plan.pdf>
- ▶ San Mateo City/County Association of Governments (C/CAG) - TDM Ordinance www.ccag.ca.gov/pdf/documents/archive/CMP%20Guidelines%20September%202004.pdf
- ▶ Downtown Ventura Mobility and Parking Plan www.cityofsanbuenaventura.net/files/community_development/resources/mobility_parking_plan.pdf

CLIMATE ACTION PLANS

Climate action plans outline a community's strategies for reducing their greenhouse gas emissions. Plans include an inventory of current emissions sources and levels, a reduction target, and a plan for achieving that target, including strategies to increase walking levels.

The City of Berkeley's Climate Action Plan was adopted in 2009. The Plan sets forth policies and actions related to buildings, personal vehicles, landfill, and food consumption and includes the following vision for the year 2050:

Public transit, walking, cycling, and other sustainable

mobility modes are the primary means of transportation for Berkeley residents and visitors.

Pedestrian-oriented Plan core strategies in support of this vision include:

- Adopt and accelerate implementation of the City's pedestrian plan;
- Continue efforts to make walking and cycling safe, healthy and enjoyable alternatives to driving; and
- Manage parking effectively to minimize driving demand and encourage and support alternatives to driving.

Model Climate Action Plans include:

- ▶ City of Berkeley www.berkeleyclimateaction.org
- ▶ City of Boulder, CO www.bouldercolorado.gov/files/Environmental%20Affairs/Climate%20and%20Energy/cap_final_25sept06.pdf

DISORIENTED PRACTICES

Over the course of the twentieth century, a federal focus on highway building and efficient movement of goods on a nationwide scale resulted in the development of many facilities for motor vehicles, with little funding allocated to mass transit, bicycle or pedestrian improvements. Meanwhile, sprawling land use patterns, such as those resulting from the separation of land uses, increased the nation's dependence on motor vehicles. Specific transportation practices that hinder pedestrian safety, convenience and access include:

- **Parking requirements** – In an effort to accommodate people traveling by car, many jurisdictions have long required the provision of a minimum number of parking spaces for new development. Such requirements often lead to expansive surface parking lots, which are far less expensive to construct than more compact multi-story parking structures and may provide more parking than is actually utilized. Large parking lots result in commercial districts that are less inviting and interesting to walk in because land is used for parking lots that could be used for public spaces or additional retail or commercial services. Similarly, residential parking requirements that result

Pedestrian-Oriented Practices

in excess spaces inflate the cost of constructing compact residential developments.

- **Street widths** – To accommodate anticipated traffic and emergency vehicles, city codes and standards often require the construction of streets of a width that makes roadway crossings by pedestrians difficult and uninviting. These streets encourage speeding, are difficult to cross and unpleasant to walk alongside.
- **No sidewalk requirements** – Although less common today in Alameda County, new residential areas have not always been required to provide sidewalks. Many neighborhoods that developed in the latter half of the twentieth century do not have pedestrian facilities, thus forcing pedestrians to share roadway space with motor vehicles.
- **Prioritization of vehicle turning movements** – In order to maintain motor vehicle travel speeds and reduce congestion caused by vehicles waiting to turn, pedestrian crossings are sometimes prohibited on specific legs of intersections. For some pedestrian trips, these prohibitions force pedestrians to cross three streets, rather than one.
- **Minimization of motor vehicle delay** – In order to maintain adequate automobile levels of service (LOS: see box on page 17), higher traffic speeds may be allowed and pedestrian crossing durations limited, both of which reduce pedestrian access, convenience, and possibly safety.
- **Curb design** – Rolled curbs, which allow cars to drive onto the sidewalk, often encourage sidewalk parking, reducing the amount of space available for safe pedestrian passage, and at times rendering the sidewalk impassable, especially to wheelchair users.
- **Curb radii** – Corners with large curb radii (or even dedicated (free) sweeping right turns) are often used to facilitate truck traffic and reduce congestion at intersections. Large radii also enable motorists to make turns at increased speeds, which compromise drivers' ability to see pedestrians waiting or proceeding to cross. Tighter turning radii slow traffic and allow drivers to see pedestrians and other vehicles in the intersection, while shortening the distance pedestrians must travel in the roadway when crossing. (See *Design Standards* chapter for further discussion of curb radii.)

The following chapter outlines best practices in design standards that, when combined with effective and strategic land use planning, can assist communities in avoiding these common pitfalls.

3. Design Standards

CHAPTER GUIDE

TOPIC: Pedestrian facility design guidelines and standards necessary to build safe, accessible and enjoyable places to walk.

AUDIENCE: Public agency planners and engineers.

CHARACTERISTICS OF A PEDESTRIAN-FRIENDLY ENVIRONMENT

The following design principles, drawn from Portland and Santa Barbara’s pedestrian master plans, represent a set of ideals which should be incorporated, to some degree, into every pedestrian infrastructure improvement. They are ordered roughly in terms of relative importance.

The pedestrian environment should be safe. Sidewalks, walkways, and crossings should: be designed and built to be free of hazards; to minimize conflicts with vehicular traffic and protruding architectural elements; and to be quiet and adequately lit. Pedestrian environments should also be designed to encourage “eyes on the street” and ensure personal safety for pedestrians.

The pedestrian network should be accessible to all. Sidewalks, walkways, and crosswalks should accommodate the needs of pedestrians, regardless of age or ability.

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 public transit.

The pedestrian environment should be easy to use. Sidewalks, walkways, and crossings should be designed so people can easily find a direct route to common destinations.

The pedestrian environment should provide a sense of place. Open spaces, such as plazas, courtyards, and squares, and building façades, which give shape to the space of the street, help create a unique pedestrian environment. Amenities such as seating, banners, public art, plantings, shade trees, and special paving, along with historical elements and cultural references, all enhance the look and feel of the pedestrian environment and contribute to a sense of place.

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

Pedestrian improvements should preserve or enhance the historical elements of a place. Local history is a source of pride and interest to pedestrians. Historic and architecturally interesting buildings and other features should be preserved. Where applicable, pedestrian improvements should restore and accentuate historic community elements.

Pedestrian improvements should be economical. Pedestrian improvements should be designed to achieve the maximum benefit for their cost, including initial and maintenance costs. The relative cost of walking vis-à-vis more expensive modes of transportation should be considered in this context. Where possible, improvements in the public right-of-way should stimulate, reinforce and connect with adjacent private improvements.

Design Standards

This chapter presents model design standards in support of these principles.

BEST PRACTICES FOR PEDESTRIAN INFRASTRUCTURE

The following selected design guidelines provide recommendations to consider when designing pedestrian infrastructure. They are based on generally accepted best practices and academic research, and should always be modified according to project-specific conditions. These guidelines are not exhaustive and may be supplemented with the toolkits and plans listed in the *Other Resources* chapter of this document. These guidelines are intended to be a resource and are not a requirement for any ACTIA or ACCMA funded projects. Please see the disclaimer inside the front cover of the Toolkit.

Overall design guidelines

Federal and state documents provide comprehensive design guidelines and regulations for pedestrian facilities. These include:

- ▶ AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, 1st Edition (note this guide is currently being updated; it is available for purchase online at https://bookstore.transportation.org/item_details.aspx?id=119)
- ▶ California Manual on Uniform Traffic Control Devices (CMUTCD) www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/ca_mutcd.htm
www.dot.ca.gov/hq/traffops/survey/pedestrian/TR_MAY0405.pdf

Federal, state and regional complete streets policies (described in Chapter 2) should be referenced when designing pedestrian facilities. The recently-completed *San Francisco Better Streets Plan* is an overall best practice resource for pedestrian infrastructure design.

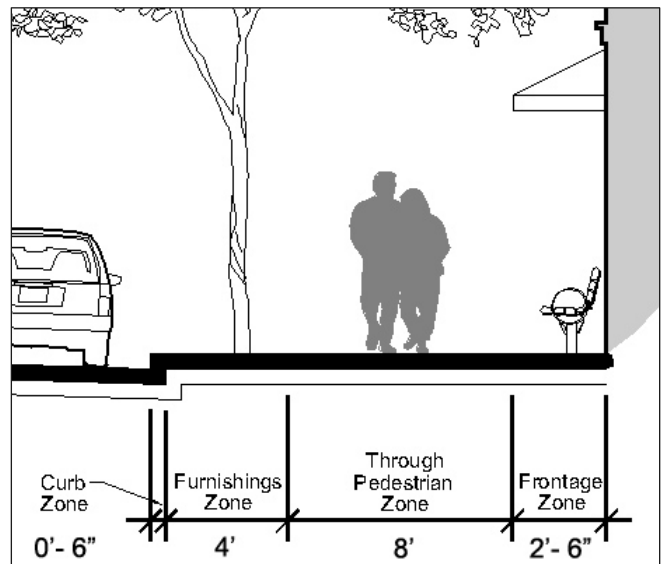
The *New York City Street Design Manual*, released in 2009, is also regarded as a model for pedestrian infrastructure design. In 2005, the Sacramento Transportation and Air Quality Collaborative released a document, *Best Practices for Complete Streets*, which provides suggested street standards to ensure routine accommodation. Urban

street design guidelines for Charlotte, NC focus on providing complete streets for all users.

- ▶ San Francisco Better Streets Plan www.sfgov.org/site/uploadedfiles/planning/Citywide/Better_Streets/index.htm
- ▶ New York City Street Design Manual www.nyc.gov/html/dot/html/about/streetdesignmanual.shtml
- ▶ Sacramento Transportation and Air Quality Collaborative Best Practices for Complete Streets www.completestreets.org/documents/FinalReportII_BCompleteStreets.pdf
- ▶ Charlotte, North Carolina Urban Street Design Guidelines www.charmeck.org/Departments/Transportation/Urban+Street+Design+Guidelines.htm

Sidewalks

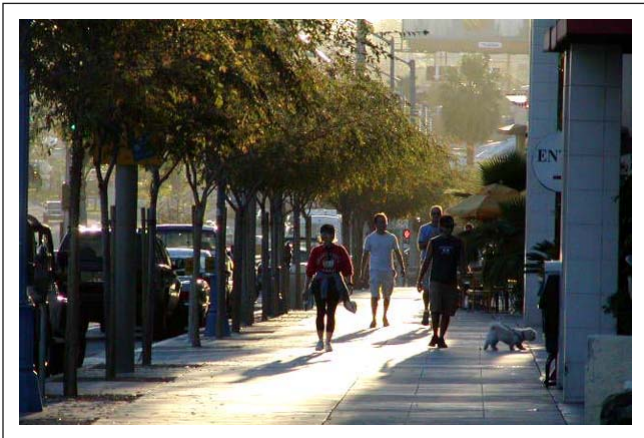
The sidewalk corridor is the portion of the pedestrian system from the edge of the roadway to the edge of private property. The sidewalk corridor provides an environment for walking that is, with the exception of driveways, separated from vehicle movement. Sidewalks should be firm and stable, resistant to slipping, and allow for ease of passage by people using canes, wheelchairs or other devices to assist mobility.



Sidewalk zones will vary with sidewalk widths and abutting land uses

Good sidewalk corridors are accessible and safe to all users, are adequately wide, provide a continuous path and a social space for people to interact, have street trees and other landscaping, and contribute to the character and identity of neighborhoods and business districts.

Sidewalk corridors should contain zones dedicated to different uses, such as a curb zone, a furnishings zone, a through-pedestrian zone and a frontage zone. The curb zone occupies the space between the roadway and the furnishings or through pedestrian zones. The furnishings zone provides a buffer for pedestrians from the adjacent roadway, and is where utility poles, streetlights, bus shelters and benches, hydrants, signs, parking meters, and street furniture should be located. The furnishings zone should include street trees whenever possible to provide shade, a buffer from traffic and, at times, a traffic calming effect. This separation of pedestrians from the street increases the perception of pedestrian safety, thus encouraging greater use of the sidewalk corridor by pedestrians.



The through pedestrian zone is the area of the sidewalk corridor intended for pedestrian travel

Although Caltrans requires minimum four-foot-wide sidewalks, with regularly spaced five-foot passing areas, where feasible the through-pedestrian zone should be five feet wide at a minimum, with six feet or more recommended, depending on the adjacent land use. Sidewalk corridors in pedestrian districts with commercial activity may be used for restaurant and café seating, in accordance with local regulations. Such seating is generally found in the frontage zone and may occasionally be placed in the furnishings zone. Additional information on sidewalk zones can be found in the City of Santa Barbara Pedestrian Plan and City of

Mountain View Sidewalk and Street Furniture Ordinance, though the links below.

- ▶ City of Santa Barbara Pedestrian Plan
www.santabarbaraca.gov/Resident/Environmental_Documents/Pedestrian/
- ▶ City of Mountain View Sidewalk and Street Furniture Ordinance
www.municode.com/Resources/gateway.asp?pid=16508&sid=5

SIDEWALK SURFACES

Sidewalks are generally constructed of Portland cement concrete. Brick or concrete unit pavers may also be used when consistent with local standards and guidelines, particularly in the Furnishings Zone or around mature trees where sidewalk uplift is a problem. Newer materials, such as rubberized sidewalk pavers provide a softer walking surface, and may prevent cracked or uplifted sidewalks where tree roots are present. The City of Alameda has installed sidewalks made of recycled rubber tires. Rubber sidewalks have also been installed in San Francisco, Danville, and Concord.

Pedestrian and multi-use paths may be constructed out of asphalt; however, asphalt is not suitable for sidewalk construction due to its shorter lifespan (ten years as opposed to 20 or more) and higher maintenance costs.

Street corners

Pedestrian activity is often concentrated at street corners. These are the places where paths converge, where walkers wait for crossing opportunities, and where people are likely to stop and converse with others. The transition between the raised sidewalk and the crosswalk at street grade occurs at corners. Street corners are the logical location for hardware such as street name signs and traffic control signs or traffic signal bases; however, these items should not obstruct pedestrian access. The design of the corner affects the speed at which turning traffic maneuvers through an intersection (see corner radius discussion below). Visibility at corners is an issue for all users of the street system. Good street corners provide a space clear of obstructions to accommodate gathering pedestrians, have ample room for transit stops and curb ramps, have clearly marked signs, and have good visibility to and from nearby travel lanes.



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

CORNER RADIUS

The corner radius is the radius of the imaginary circle drawn by continuing the curve of a curb along a street corner. In general, the smaller the curb radius, the better for pedestrians because it 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. A small corner radius is also beneficial for street sweeping operations.

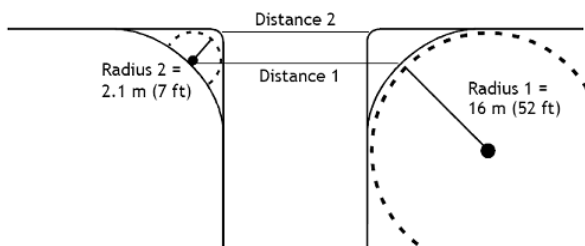


Image source: FHWA/Turner-Fairbank Highway Research Center

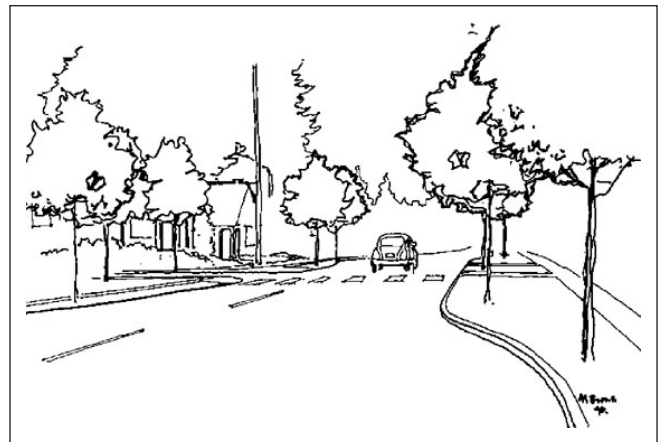
The presence of a lane for parking and/or bicycles creates an “effective radius” that allows a smaller corner radius to be used than would be required by vehicles commonly using the intersection. The corner radius should be designed keeping in mind the types of vehicles that typically make right turns at the location, including buses and large trucks. As shown in the figure, a conventional radius of as much as 52 feet can be reduced to seven feet, a standard recommended by the Federal Highway Administration to slow traffic, while still serving most vehicle types and significantly reducing pedestrian

crossing distances and vehicle speeds. More information regarding street corner design may be found at:

- ▶ Developing Curb Ramp Designs Based on Curb Radius www.ite.org/accessible/curbramp/jb05da26.pdf
- ▶ FHWA Pedestrian/Bicycle Course www.tfhrc.gov/safety/pedbike/pubs/05085/chapt20.htm

CURB EXTENSIONS/BULB-OUTS

Curb extensions (sometimes called curb bulbs or bulb-outs) have many benefits for pedestrians. They shorten the street crossing distance, provide additional space at corners, allow pedestrians to see and be seen before entering the crosswalk, and simplify the placement of elements like curb ramps. Curb extensions may be used at any corner or mid-block location where there is a marked crosswalk and a parking lane that can absorb the extension of the curb. In high pedestrian use areas, curb extensions are preferred for corner reconstruction except where there are extenuating design considerations such as a high level of turning movements by emergency vehicles and/or transit vehicles, or severe pressure on on-street parking supply.



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

Curb extensions have the potential to conflict with bicycle travel if not properly designed. Curb extensions should never extend into a bike lane, and should generally align with the edge of the parking lane. (Further information on potential conflicts between bicycle and pedestrian facility design is discussed in more detail in the *Designing Complete Streets* section later in this chapter.)

Curb extensions may include transit stops, or “bus bulbs,” which eliminate the need for buses to pull out of the travel lane to load and unload passengers. At corners with bus stops, bulbs should be at least as long as the buses that stop there. If the bulb is shorter, the rear doors of the bus can land behind the bulb, discharging passengers unsafely into the street. An in-depth discussion of curb extensions and bulb-outs can be found in the City of Portland *Pedestrian Design Guidelines*, via the link below.

-
- ▶ City of Portland *Pedestrian Design Guidelines*
www.portlandonline.com/transportation/index.cfm?&a=ieaei
 - ▶ *Designing with Transit*
www.actransit.org/pdf/designing_with_transit.pdf
-

Street crossings

GUIDELINES FOR CROSSWALKS

Well-marked pedestrian crossings accomplish many goals. They channelize pedestrians, create an atmosphere of walkability and accessibility for pedestrians and prepare drivers for the likelihood of encountering a pedestrian. Marked crossings reinforce the location and legitimacy of a crossing; however, motor vehicle codes generally require vehicles to yield the right-of-way to pedestrians at any intersection where crossing is not prohibited (regardless of the presence or absence of a crosswalk). Crossing between adjacent, signalized intersections or anywhere crossing is prohibited is considered jaywalking and is illegal.

While pedestrians and drivers have a responsibility to behave in accordance with the vehicle code, planners and engineers also have a responsibility to provide safe crossing locations and facilities. Autos, buses, and bicycles traveling on the roadway or turning corners, all traverse crosswalks at every intersection, each time creating the possibility of a collision with a pedestrian. Good crosswalks are easy for pedestrians and roadway users to understand, are free of obstructions or barriers (such as medians that project into the crosswalk), and allow pedestrians full visibility of approaching traffic and vice versa.

Intersection crossing distances should be minimized, when possible, through the use of curb extensions and refuge islands in order to reduce the time pedestrians are

susceptible to collisions with vehicles. Where feasible, crosswalks should be installed at a 90-degree angle to the curb in order to help pedestrians with visual impairments navigate roadway crossings. Crosswalk visibility and effectiveness may be augmented with signage, additional striping or other treatments, described in more detail below.

Crosswalks must be sited to maximize the distance from which pedestrians are visible to motorists; at a minimum, not closer than the vehicle’s stopping distance. Wherever possible crosswalks should follow “desire lines,” the natural path a pedestrian would travel to a destination. Jurisdictions should consider developing crosswalk policies that outline where crosswalks should be placed, with thresholds for the number of pedestrians, recent pedestrian-vehicle collisions, and nearby land uses (which may indicate latent pedestrian demand). Sample crosswalk policies are presented via the below links.

-
- ▶ California Vehicle Codes Relating to Pedestrians
www.walksf.org/vehicleCodes.html
 - ▶ Sacramento Crosswalk Policy
www.cityofsacramento.org/dsd/development-engineering/documents/Ped_Safety.pdf
 - ▶ Stockton Crosswalk Policy
www.stocktongov.com/publicworks/publications/Ped_Guidelines.pdf
-

MARKED VERSUS UNMARKED CROSSWALKS

Providing marked crosswalks at uncontrolled locations (where no stop sign or traffic signal controls vehicular traffic) has been controversial in the past, but recent research has dispelled many of the concerns regarding marked crosswalks. While there is evidence that providing a marked crosswalk *alone* on multi-lane, high-volume, high-speed roadways may result in a higher vehicle-pedestrian collision rate when compared to unmarked locations, generally lower-volume roadways with lower speeds and two to three traffic lanes are good candidates for marked crosswalks. On multi-lane roads, the Federal Highway Administration advises providing marked crosswalks to serve desire lines, with additional safety treatments, such as flashing beacons, traffic signals, or even grade separation, as needed. NCHRP (the National Cooperative Highway Research Program) Report 562 presents a toolbox of crosswalk enhancements and their associated effectiveness.

Design Standards

A recent Caltrans/UC Berkeley study considered pedestrian and driver behavioral differences between marked and unmarked crosswalks. The study concluded that drivers yield more frequently to pedestrians in marked crosswalks and that pedestrians in unmarked crosswalks tend to wait for larger gaps in traffic before crossing and walk at a faster pace compared to pedestrians in marked crosswalks. Multiple threat scenarios (where one driver yields but the driver in the adjacent, same direction lane does not) were observed more frequently at marked crosswalks on multi-lane roads than at unmarked crosswalks on the same type of road. Researchers suggested these behavioral differences may be in part explained by a lack of knowledge of pedestrian right-of-way laws with respect to marked versus unmarked crosswalks. The findings may also help to explain the collision rate differences in multi-lane marked versus unmarked crosswalks.

Marked crosswalks should be thought of as just one of a progression of design treatments that allow pedestrians to safely cross the street. Marked crosswalks should be provided at all signalized intersections and at other locations where there is a need to specify recommended crossing locations. In many cases marked crosswalks are best used in combination with other treatments (e.g., curb extensions, raised crossing islands, traffic signals, roadway narrowing, enhanced overhead lighting, traffic-calming measures, etc.). For more discussion of the safety of marked versus unmarked crosswalks, and recommended guidelines for crosswalk installation, see the link shown below.

-
- ▶ Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations (FHWA, 2001)
www.tfhrf.gov/safety/pubs/04100/index.htm
 - ▶ National Cooperative Highway Research Program Report on Crosswalks at Uncontrolled Locations (NCHRP Report 562)
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf
 - ▶ Caltrans/UC Berkeley Study on Pedestrian/Driver Behavior at Marked versus Unmarked Crosswalks
repositories.cdlib.org/its/tsc/UCB-TSC-RR-2007-4/
-

DETERMINING WHERE AND HOW TO MARK CROSSWALKS

The first step in identifying candidate crosswalk locations at uncontrolled intersections and mid-block locations is

to identify the origins and destinations people like and need to walk between, which are typically determined by local land uses, such as homes, schools, parks, commercial establishments, and transit stops.

The second step is identifying the safest locations for people to cross. Of all road users, pedestrians have the highest risk because they are the least protected. Alameda County pedestrians represent 23 percent of all traffic fatalities while walking accounts for only 12 percent of total trips (see companion Pedestrian Plan for more information). The following section provides guidelines for these two steps.

Demand and safety considerations for crosswalks

The following is the recommended, or best, practice for pedestrian treatments at uncontrolled intersections and mid-block locations.³

Crossings should be marked where all of the following occur:

- Sufficient demand exists to justify the installation of a crosswalk (see below).
- The location has sufficient sight distance (sight distance in feet should be greater than 10 times the speed limit) and/or sight distance will be improved prior to crosswalk marking.
- Safety considerations do not preclude a crosswalk.

Demand Considerations: Uncontrolled and mid-block crossings should be identified as a candidate for marking if there is a demonstrated need for a crosswalk. Need can be demonstrated by any of the following:

- Location near existing or proposed pedestrian generators (such as a school or park)
- Existing pedestrian volumes
- Pedestrian-vehicle collisions at this location (over several years)
- Distance from nearest marked crosswalk
- Citizen surveys, requests, walking audits, etc.

Specific demand considerations should be determined locally and be included in crosswalk policies. Rural communities may consider reducing pedestrian volume or collision requirements.

³ The most common crosswalk of this type will be at intersections where a minor side street is stop controlled and a major street is uncontrolled.

Considerations for multi-lane, high volume, and/or high speed roadways

For candidate crosswalk locations on either a multi-lane street (three or more lanes), on two-lane streets with 12,000 or more daily traffic volumes (ADT) or with a posted speed limit exceeding 30 miles per hour, enhanced treatments beyond striping and signing may be needed. Additional funding sources should be identified as needed for these enhancements; failing to provide an enhanced crosswalk and/or removing a crosswalk because it cannot be enhanced should be an option of last resort.

APPROPRIATE CROSSWALK TREATMENTS

The first step in identifying the appropriate treatment for a given crosswalk is to determine if the pedestrian and vehicle volumes at the site meet the signal warrant requirements for installing a pedestrian signal. If the

warrant is not met, one or more less “intense” treatments may be appropriate, as described below.

Pedestrian Level of Service, or the average delay experienced by pedestrians as they are waiting to cross the street (typically worse at multi-lane, high speed, and high volume roads) and expected motorist compliance (typical motorist responses to pedestrians attempting to cross the street) are key variables for treatment identification.

The treatment identification matrix below illustrates how pedestrian LOS and motorist compliance can point to different types of crosswalk treatments. The levels noted in the matrix range from basic treatments (level 1) to the most significant or “intense” treatments for uncontrolled locations (level 4). More details are provided for each of these treatments on pages 32-37.

Example Matrix for Selecting Crosswalk Treatments

PEDESTRIAN LEVEL OF SERVICE ⁴	EXPECTED MOTORIST COMPLIANCE		
	LOW (or Speed > 30 MPH)	MODERATE	HIGH
LOS A-D (average delay up to 30 seconds)	<p>LEVEL 3 2 lane road: In-pavement flashers, overhead flashing beacons Multi-lane road: Stutter flash Plus LEVELS 1 AND 2</p>	<p>LEVEL 2 Curb Extensions, Bus Bulb, Reduced Curb Radii, Staggered Pedestrian Refuge Plus LEVEL 1</p>	<p>LEVEL 1 High Visibility Crosswalk Markings, Advance Yield Lines, Advance signage</p>
LOS E-F (average delay greater than 30 seconds)	<p>LEVEL 4 HAWK, Stutter Flash, or Direct Pedestrians to Nearest Safe Crossing PLUS LEVELS 1 AND 2</p>	<p>LEVEL 3 2 lane road: In-pavement flashers, overhead flashing beacons Multi-lane road: Stutter flash Plus LEVELS 1 AND 2</p>	<p>LEVEL 2 Curb Extensions, Reduced Curb Radii, Staggered Pedestrian Refuge Plus LEVEL 1</p>

⁴ Based on the pedestrian level of service criteria as defined in the 2000 Highway Capacity Manual, Table 18-13 (LOS Criteria for Pedestrians at Unsignalized Intersections) for average delay/pedestrian, where delay is calculated as a function of vehicle flow rates and critical gaps (which are a function of walking speed, crosswalk length, and startup and end clearance times). See the “documentation” tab in the Treatment Identification Tool for formulae and additional details.

Design Standards

Mid-block crossings

Because pedestrians tend to take the most direct route to their destination, there is significant demand for mid-block crossings when the nearest crosswalk is too far to expect pedestrians to walk (greater than 300 to 500 feet between intersections). By channeling pedestrians to a preferred mid-block crossing location, mid-block crosswalks can increase pedestrian safety where blocks are too long to expect all crossings to occur at intersections and in places where large numbers of people are crossing mid-block. Mid-block crossings may also be preferable where nearby intersections fail to accommodate pedestrians with crosswalks on all approaches because of multiple turn lanes, etc.

Selection of appropriate locations should be undertaken carefully, especially on multi-lane roads with heavy traffic volumes. As part of the review process for crosswalk installation, an engineering study should be used to analyze factors including (but not limited to) gaps in traffic, approach speed, sight distances, illumination, the needs of special populations, and the distance to the nearest traffic signal. Mid-block crossings may be coupled with medians or pedestrian refuges to shorten crossing distances, especially in multi-lane locations with high volume and high speed vehicular traffic.

Mid-block crossings may be signalized, although signalization is only needed in limited instances where traffic volumes prohibit adequate pedestrian crossing time.

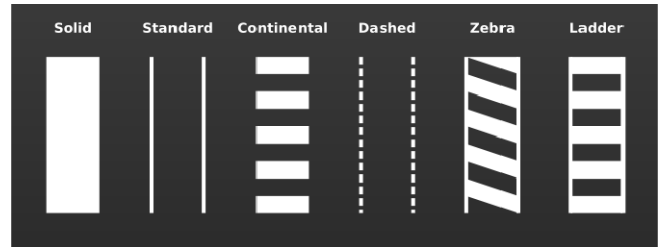
As with crosswalks at intersections, a crosswalk policy is recommended to provide transparent guidance on where mid-block crosswalks should be located and what enhanced treatments should be considered.

► Additional FHWA information on mid-block crossings safety.fhwa.dot.gov/ped_bike/univcourse/swless16.htm

CROSSWALK STRIPING PATTERNS

The most common types of crosswalk striping are shown in the diagram below. The standard or “transverse” crosswalk striping pattern consists of two parallel lines. In California the standard crosswalk marking color is white, except for crosswalks in school areas, which are painted yellow.

A number of “high-visibility” patterns are also in use, such as the ladder, zebra and continental patterns, which add bars for increased visibility. The triple-four crosswalk, a variation on the continental style with four feet of horizontal striping, a four-foot open space, and another four feet of striping, was developed in Sacramento and is considered a best practice for its low maintenance costs and high visibility for drivers and sight-limited pedestrians.



Common crosswalk markings (source: FHWA, Planning and Designing for Pedestrian Safety Course, 2008)

Application of high-visibility patterns varies widely from jurisdiction to jurisdiction; in some cities they are not used at all, while in other cities high-visibility crosswalks are installed as standard in areas such as a downtown. High-visibility markings should be considered for any area with high pedestrian volumes, major pedestrian generators nearby (e.g., schools, libraries, or senior centers), or where the conditions warrant an increased visibility marking (e.g. a mid-block location). Use of high visibility crosswalks may be limited to uncontrolled locations as a prioritization policy.

Even within a jurisdiction, there may not be consistent application of high-visibility patterns. It is recommended that jurisdictions choosing to install high-visibility crosswalks adopt a single pattern and apply it consistently throughout the jurisdiction. Standardizing crosswalk markings helps both motorists and pedestrians recognize designated crossings.

ADVANCE STOP BARS AND YIELD LINES

Stop bars are solid white lines perpendicular to traffic, which extend across traffic lanes to indicate where vehicles are supposed to stop at a STOP sign or traffic signal. The Manual on Uniform Traffic Control Devices (MUTCD) requires that, if used, stop bars must be placed a minimum of four feet in advance of the near crosswalk line. However, studies have shown that moving the stop bar farther back from the crosswalk can provide an improved factor of safety and improved visibility of

pedestrians. In places where the stop bar is striped 15 to 30 feet in advance of a marked crosswalk, considerable safety benefits for pedestrians have been demonstrated.⁵

At uncontrolled intersections (i.e., with neither traffic signals nor stop signs), stop bars are prohibited in California, but a “yield” line may be used (because state law requires motorists to yield to pedestrians in a crosswalk). Yield lines consist of a row of solid white isosceles triangles pointing toward approaching vehicles, and are often referred to as “shark’s teeth.” As with stop bars, locating the yield lines farther back from the crosswalk can help to improve the motorist’s view of the pedestrian. This is especially important at multi-lane crossings, where drivers who yield too close to crosswalks place pedestrians at risk by blocking other drivers’ views of pedestrians, and pedestrians’ views of other vehicles (this is known as a multiple threat collision).

ADDITIONAL CROSSWALK TREATMENTS

Aside from the striping pattern, other crosswalk surface treatments can include textured surfaces or colored pavement. While such treatment may provide aesthetic benefits, they rarely increase the visibility of the crosswalk or pedestrians. These treatments can also be expensive to implement and often require additional maintenance. Textured surfaces, such as concrete or brick pavers, are generally not recommended for use in a crossing because they can be difficult for wheelchair users to navigate, create long-term maintenance issues, and do not increase visibility to drivers. All crosswalks should be kept free of debris, potholes and loose utility plates.

Other high-visibility treatments include fluorescent yellow green signage, flashing beacons, and “Yield to Pedestrian” sign paddles that are mounted in the center of the road at the crosswalk. Another treatment that is being increasingly utilized is in-pavement crosswalk lighting, which consists of flashers embedded in the street pavement adjacent to the outside of the crosswalk markings, positioned to be seen by motorized traffic approaching the crosswalk from both directions. The

⁵ Van Houten, Ron and J.E. Louis Malenfant, Canadian Research on Pedestrian Safety, Report No. FHWA/RD-99/090, Federal Highway Administration, Washington, DC, 1999.

lights are actuated, either through a push-button or a motion sensor, to flash while pedestrians are in the crosswalk. Several studies, including one based on the installation of in-pavement crosswalk lights in the City of Santa Rosa, have found that flashing lights embedded in the pavement at uncontrolled crosswalks have a positive effect on enhancing a driver’s awareness of crosswalks and modifying driver habits to be more favorable to pedestrians. These treatments should be limited to use at locations such as schools or senior centers, where additional maintenance costs are justified.⁶




An adopted crosswalk policy with treatment selection guidelines is recommended to allow jurisdictions to match treatments with local site characteristics, based on the studied effectiveness of the various treatments in varying contexts.



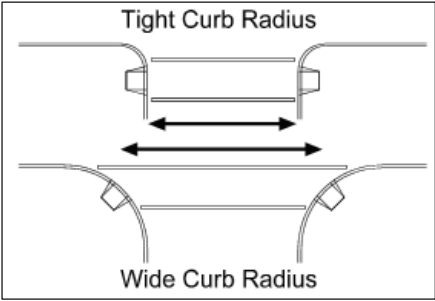
The table that begins on the following page summarizes various crosswalk treatments, their benefits and recommended locations for their application and is organized according to the level of implementation effort and investment needed. Most of the research summarized in this table is documented in NCHRP Report 562.

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- ▶ National Cooperative Highway Research Program Report on Crosswalks at Uncontrolled Locations (NCHRP Report 562) onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf
 - ▶ MTC Pedestrian Safety Toolbox www.mtc.ca.gov/planning/bicyclespedestrians/safety/overview.htm
 - ▶ An Evaluation of High-Visibility Crosswalk Treatment - Clearwater, Florida (FHWA-RD-00-105, August 2001) www.tfhrc.gov/safety/pedbike/pubs/0105.pdf
 - ▶ ITE’s Innovative Treatments at Unsignalized Pedestrian Crossing Locations www.ite.org/traffic/documents/AB00H5102.pdf
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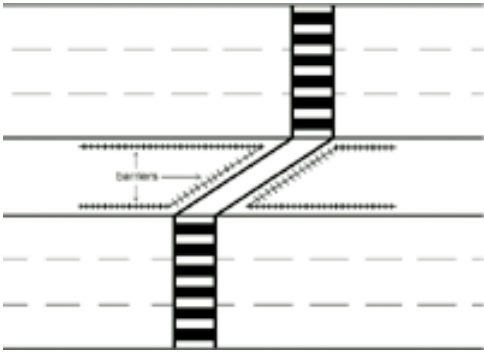
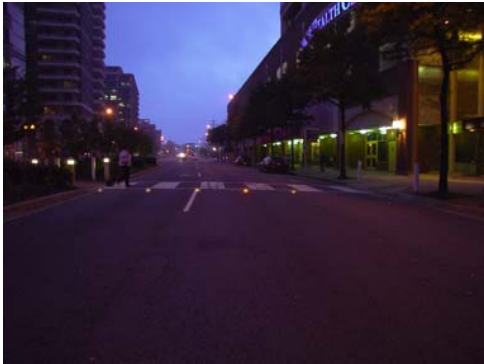

⁶ Whitlock & Weinberger Transportation. An Evaluation of a Crosswalk Warning System Utilizing In-Pavement Flashing Lights. Prepared for the State of California Office of Traffic Safety and the Federal Highway Administration. Santa Rosa, Calif., 1998.




Crosswalk Treatments



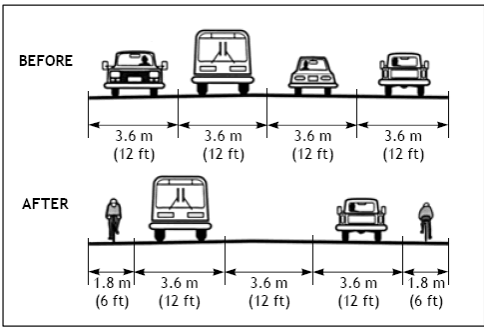
Measure	Description	Benefits	Application
Level 1 (striping and signing)			
<p>Marked Crosswalk</p>  <p><i>Image source: FHWA, Planning and Designing for Pedestrian Safety Course, 2008</i></p>	<p>Marked crosswalks should be installed to provide designated pedestrian crossings at major pedestrian generators, crossings with significant pedestrian volumes (at least 15 per hour), crossings with high vehicle-pedestrian collisions, and other areas based on engineering judgment.</p>	<p>Marked crosswalks provide a designated crossing, which may improve walkability by signaling to both pedestrians and vehicles a clear “channel” for pedestrian pathways.</p>	<p>Marked crosswalks alone should not be installed on multi-lane roads with more than about 10,000 vehicles/day. Enhanced crosswalk treatments (as presented in this table) should supplement marked crosswalks in these locations.</p>
<p>High-Visibility Signs and Markings</p>  <p><i>Image source: exodusinnovations.com</i></p>	<p>High-visibility markings include a family of crosswalk striping styles such as the “ladder” and the “continental.” High-visibility fluorescent yellow green signs are posted to increase the visibility of a pedestrian crossing.</p>	<p>FHWA recently ended its approval process for the experimental use of fluorescent yellow crosswalk pavement markings and found that they had no discernable benefit over white markings.</p>	<p>Beneficial in areas with high pedestrian activity, such as near schools, and in areas where travel speeds are high and/or motorist visibility of pedestrians is low.</p>
<p>Advanced stop bars or yield lines</p>  <p><i>Image source: www.saferoutesinfo.org</i></p>	<p>Standard white stop or yield limit lines are placed in advance of marked, uncontrolled crosswalks. Stop or yield lines are determined based on state vehicle codes (that require drivers to either stop or yield to pedestrians at intersections).</p>	<p>Increases the pedestrian’s visibility to motorists, reduces number of vehicles encroaching on the crosswalk, and improves general pedestrian conditions on multi-lane roadways. An affordable treatment.</p>	<p>Useful in areas where pedestrian visibility is low and in areas with aggressive drivers, as advance limit lines will help prevent drivers from encroaching on the crosswalk. Addresses the multiple-threat collision on multi-lane roads.</p>


Measure	Description	Benefits	Application
<p>In-Street Pedestrian Crossing Signs</p>  <p>R1-6</p> <p><i>Image source: Manual of Traffic Signs</i></p>	<p>This measure involves posting regulatory pedestrian signage on lane edge lines and road centerlines. The In-Street Pedestrian Crossing sign may be used to remind road users of laws regarding right of way at an unsignalized pedestrian crossing.</p>	<p>This measure is highly visible to motorists and has a positive impact on pedestrian safety at crosswalks.</p>	<p>Mid-block crosswalks, unsignalized intersections, low-speed areas, and two-lane roadways are ideal for this pedestrian treatment.</p>
<p>Level 2 (geometric changes)</p>			
<p>Curb Extension/ Bulb Outs</p>  <p><i>Image source: Dan Burden</i></p>	<p>Consists of an extension of the curb into the street.</p>	<p>Narrows distance pedestrian has to cross; increases sidewalk space on corners; slows traffic; increases driver awareness of pedestrians; improves emergency vehicle access because vehicles can climb a curb, but not a parked car; reduces space for illegal or aggressive motorist behavior.</p>	<p>Due to high installation cost, suitable only on streets with high pedestrian activity, on-street parking (because space is already not used for traffic) and no (or infrequent) curb-edge transit service. Often used in combination with high-visibility crosswalks or other markings. Need to avoid conflict with bicycle lanes.</p>
<p>Reduced Curb Radii</p>  <p><i>Image source: www.ci.austin.tx.us</i></p>	<p>The radius of a curb can be reduced to require motorists to make a tighter turn.</p>	<p>Shorter radii narrow the distance that pedestrians have to cross; reduce speed of turning traffic; increase driver awareness (like curb extensions); and can be easier and less difficult to implement than curb extensions and bulb outs, depending on location of drainage and fire hydrants.</p>	<p>Beneficial on streets with high pedestrian activity, on-street parking and/or bicycle lanes (which create larger effective radius). More suitable for wider roadways and roadways with low volumes of heavy truck traffic.</p>

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Measure	Description	Benefits	Application
<p>Staggered median pedestrian island</p>  <p><i>Image source: www.walkinginfo.org</i></p>	<p>Similar to traditional median refuge islands, but crosswalks are staggered such that pedestrians cross traffic in one direction, then walk toward traffic moving in the other direction to reach the second half of the crosswalk.</p>	<p>Increases pedestrian awareness of traffic because they are facing it and provides better traffic views for pedestrians and motorists.</p>	<p>Best used on multi-lane roads with obstructed pedestrian visibility or with off-set intersections. Must be accessible, including railings and truncated domes to direct sight-impaired pedestrians along the path of travel.</p>
<p>Level 3 (warning beacons and related devices)</p>			
<p>In-Roadway Warning Lights</p>  <p><i>Image source: FHWA/Turner-Fairbank Highway Research Center</i></p>	<p>Both sides of a crosswalk are lined with pavement markers containing amber LED strobe lights that can be push-button activated or activated with pedestrian detection.</p>	<p>This measure provides a dynamic visual cue, and is effective in bad weather</p>	<p>May not be appropriate in areas with heavy winter weather (due to high snow removal costs); for east/west roads or locations with reflected light (because bright light can make lights difficult to see); and in locations with high bicycle ridership (because raised markers present a hazard to bicyclists). May cause confusion when pedestrians fail to activate them and/or when they falsely activate.</p>
<p>Overhead Flashing Beacons</p>  <p><i>Image source: tti.tamu.edu</i></p>	<p>Flashing amber lights installed on overhead signs, in advance of or at the entrance to a crosswalk.</p>	<p>Blinking lights during pedestrian crossing times increase number of drivers who yield for pedestrians, thus reducing pedestrian-vehicle conflicts. Can be used on one-lane or multi-lane roadways.</p>	<p>Best used in places where motorists cannot see a traditional sign due to topography or other barriers.</p>

Measure	Description	Benefits	Application
<p>Animated Eyes</p>  <p><i>Image source: www.walkinginfo.org</i></p>	<p>An LED sign depicting a pedestrian alongside a pair of eyes looking back and forth.</p>	<p>Encourages pedestrians to look for motorists even when they have the right-of-way. May also alert motorists to presence of pedestrians in crosswalk.</p>	<p>Multi-lane roads, streets with on-street parking, near parking garages or other walls, at exits to retail drive-throughs. May be added to a pedestrian signal.</p>
<p>Stutter Flash</p>  <p><i>Image source: www.mutcd.fhwa.dot.gov</i></p>	<p>Rapid flashing LED lamps combined with pedestrian crossing signage. An alternative to traditional slow flashing incandescent lamps in overhead flashing beacons. May be push-button activated or activated with pedestrian detection.</p>	<p>Increases driver yielding behavior. Solar panels reduce energy costs.</p>	<p>Multi-lane roadways. (Experimental device - not included in current MUTCD.)</p>
<p>Level 4 (HAWK beacons)</p>			
<p>Hawk Beacon Signal</p>  <p><i>Image source: www.saferoutesinfo.org</i></p>	<p>Pedestrian-actuated signals that are a combination of a beacon flasher and a traffic control signal. When actuated, HAWK displays a yellow (warning) indication followed by a solid red light. During pedestrian clearance, the driver sees a flashing red “wig-wag” pattern until the clearance interval has ended and the signal goes dark.</p>	<p>Reduces pedestrian-vehicle conflicts and slows traffic speeds.</p>	<p>Where pedestrians find it difficult to find gaps in automobile traffic in which to cross safely, but where normal signal warrants are not satisfied. Appropriate for multi-lane roadways. (Experimental device - not included in current MUTCD.)</p>

Measure	Description	Benefits	Application
Level 5 (signals and grade separation)			
<p data-bbox="100 302 250 331">Traffic Signal</p>  <p data-bbox="100 667 522 697">Image source: www.livablestreets.com</p>	<p data-bbox="623 302 889 483">Conventional traffic control devices with warrants for use based on the Manual on Uniform Control Devices (MUTCD).</p>	<p data-bbox="909 302 1136 390">Reduces pedestrian-vehicle conflicts and slows traffic speeds.</p>	<p data-bbox="1195 302 1455 844">Must meet warrants based on traffic and pedestrian volumes; however, exceptions are possible based on demonstrated pedestrian safety concerns (collision history). Upcoming revisions to the MUTCD will require countdown pedestrian signal heads for all new traffic signals and all existing pedestrian signal heads to be updated to countdown signals within ten years.</p>
<p data-bbox="100 869 461 898">Pedestrian Overpass/ Underpass</p>  <p data-bbox="100 1314 571 1373">Image source: Metropolitan Transportation Commission</p>	<p data-bbox="623 869 889 1138">Grade-separated bicycle- and pedestrian-only pathway. Normally used where no other pedestrian facility is available to cross major barriers, such as freeways and railroad tracks.</p>	<p data-bbox="909 869 1169 1050">Allows for the uninterrupted flow of pedestrian movement separate from vehicle traffic. Security can be an issue in underpasses.</p>	<p data-bbox="1195 869 1455 1293">Where there is no other direct and safe way for pedestrians to reach other side of a barrier. Use of either type of facility falls off rapidly when the additional time required for such use amounts to 20% or more of the time required to cross at grade. This measure should be considered only with further study.</p>
Consider for All Multi-Lane Roads			
<p data-bbox="100 1446 451 1476">Road Diet (aka Lane Reduction)</p>  <p data-bbox="100 1856 513 1915">Image source: FHWA/Turner-Fairbank Highway Research Center</p>	<p data-bbox="623 1446 889 1627">The number of travel lanes is reduced, usually from four lanes to three. Allows sidewalk widening and addition of bicycle lanes.</p>	<p data-bbox="909 1446 1169 1564">Reduces number of traffic lanes pedestrians need to cross on multi-lane roadways.</p>	<p data-bbox="1195 1446 1455 1782">Roadways with surplus roadway capacity (typically multi-lane roadways with less than 15,000 to 17,000 ADT) and high bicycle volumes. Areas that would benefit from curb extensions but have infrastructure in the way.</p>

Measure	Description	Benefits	Application
<p>Median Pedestrian Island</p>  <p><i>Image source: http://thegoodcity.wordpress.com/category/transportation</i></p>	<p>Raised islands in the center of a roadway, separating opposing lanes of traffic with cutouts for accessibility along the pedestrian path across the street.</p>	<p>Allows pedestrians to focus on just one direction of traffic at a time. Provides pedestrians with a good view of oncoming traffic and vice versa.</p>	<p>Multi-lane roads wide enough to accommodate an ADA-accessible median.</p>

TRAFFIC SIGNALS

Traffic signals generally operate in one of three modes: fixed-time signals, which have a regular cycle of phases; fully-actuated signals, which use detection of vehicles and pedestrians to actuate all movements through the intersection; and semi-actuated signals which have vehicle and pedestrian detection only on one of the streets being controlled.



Pedestrian push button

Traffic signals in areas of high pedestrian activity, such as downtowns and shopping districts, should include a fixed-time pedestrian signal phase to improve pedestrian convenience. In both actuated signal situations, the pedestrian waiting to cross must be detected, typically by

pushing a button to get a WALK phase. Pedestrian-only traffic signals can be 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.

The wait time once a pedestrian is detected should not exceed one minute, if possible. Longer wait times encourage jay-walking, mid-block crossings, and other unsafe pedestrian behavior.

Crossing times – The Manual on Uniform Traffic Control Devices (MUTCD) states that the pedestrian clearance time should be sufficient to allow a pedestrian who leaves the curb or shoulder during the WALK signal indication to travel at a maximum walking speed of 4.0 feet per second, to reach the far side of the traveled way, or at least a median of sufficient width for pedestrians to wait for the next WALK phase. The 4.0 feet per second “normal” walking rate has been hotly debated by transportation professionals, as many feel that it does not adequately take into account users who may walk slower, such as children or senior citizens. The MUTCD notes that a walking speed of less than four feet per second should be considered when calculating crossing times for pedestrians who walk slower than normal or wheelchair-users, but does not provide specific recommendations for an adjusted rate. Many transportation engineers working on pedestrian issues recommend using a walking speed of 3.0 or 3.5 feet per

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second in areas with high concentrations of schoolchildren or senior citizens. The next version of the MUTCD (anticipated in 2009) is expected to recommend a standard walking speed of 3.5 feet/second. In San Francisco a walking speed of 2.5 feet/second is currently provided in high pedestrian areas.

Detection of pedestrians – A variety of technologies can be used to detect pedestrians, the most common of which is the pedestrian push button. Buttons should be accessible to people in wheelchairs and be easy to find for the sight-impaired. Push buttons should be located at the level top of the curb ramp and should be approximately 30 inches above ground level. Larger push buttons are preferred to smaller ones for ease of use by pedestrians with limited dexterity. Some buttons include tactile, vibrotactile, and auditory features intended to provide crossing or intersection information to hearing and/or visually-impaired pedestrians, and may include Braille, vibrating surfaces, or locator tones. Instructional signage on how to use push buttons should accompany these devices. Push buttons should be provided on separate poles, one per crosswalk.

Passive detection is sometimes preferred to push buttons because it does not rely on the pedestrian taking action to get a WALK phase. In addition to sensing if a pedestrian is waiting to cross, passive detectors can also sense if a pedestrian crosses before the WALK is actuated, and will cancel the call for WALK so that traffic is not stopped unnecessarily. Passive detection can detect pedestrians who need more time to cross, and then can extend the WALK or clearance interval. Passive detection is especially helpful where it is difficult to engineer accessible buttons, or where audible buttons may disturb neighbors. Passive technologies, which are often used in combination, include:

- **Infrared/microwave** – Detects a change in the thermal contrast within a defined field of vision;
- **Ultrasonic** – Emits an ultrasonic sound and listens for an echo bouncing off an object that is found within its field of view;
- **Doppler radar** – Analyzes the change in frequency of a radio wave as it bounces back from an object moving within its detection range;
- **Video imaging** – Analyzes the change in pixels of a video image in order to detect movement within a defined zone; and
- **Piezometric technologies** – Senses changes of pressure when a pedestrian steps on a weight sensor.

Currently, there is some concern that passive detectors may not detect all waiting pedestrians, or conversely, may be oversensitive and detect pedestrians walking nearby, but who do not wish to cross. Passive detection technology is fairly new and is being continually improved. The City of San Francisco has compared the sensitivity and selectivity of proprietary infrared detection bollards used by LightGuard™ for in-pavement crosswalk lights to overhead microwave detection. Based partly on lower sensitivity and selectivity levels, the City removed the microwave-actuated device. The ITE Pedestrian/Bicycle Council is conducting a study of current industry practices and research needs in this area.

► Passive detection technology

www.walkinginfo.org/aps/chapter4_detection.cfm

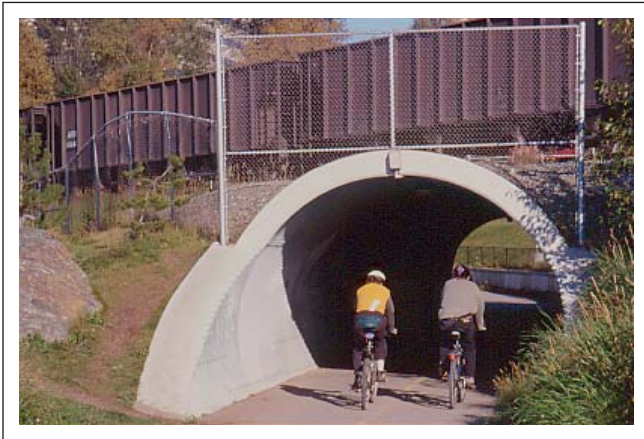
Pedestrian-only signal phases – Depending on the length of the signal cycle, an exclusive pedestrian-only signal phase can alleviate potential pedestrian versus vehicle turning conflicts, vehicle delays, and the needs of public transit at the same location. A pedestrian-only signal phase is especially appropriate in high pedestrian use areas with high rates of turning vehicles. However, this type of phasing may be confusing for people with visual impairments.

If done on all four legs of an intersection simultaneously, an exclusive pedestrian phase is referred to as a “pedestrian scramble,” as pedestrians are permitted to cross on the diagonals as well as within the normal crosswalks. There is a pedestrian scramble in Oakland’s Chinatown, at Eighth and Webster Streets and in San Francisco along Montgomery Street in the Financial District.

Another pedestrian signal timing option is the Leading Pedestrian Interval (LPI). An LPI gives pedestrians a walk signal a few seconds before motorists get a green light, which makes pedestrians more visible to motorists and therefore motorists are more likely to yield to them. The intersection of University and Shattuck Square in downtown Berkeley has an LPI. Based on recent

research, right turns on red may need to be prohibited with LPI installation outside downtown areas.⁷

- ▶ [Walkinginfo.org: Traffic Signal Enhancements](http://www.walkinginfo.org/engineering/crossings-signals.cfm#traffic-signal-enhancements)



GRADE-SEPARATED CROSSINGS

Occasionally, it may be necessary to raise or lower a pedestrian crossing above or below the existing grade, using a pedestrian bridge or underpass. Due to their high cost, grade-separated crossings should only be considered when there are no safe and convenient alternative routes. Overcrossings or undercrossings may be required to cross a freeway, major highway, rail line or waterway. Even in these cases, grade-separated crossings should be built only after careful consideration. Those that require significant elevation change can be infrequently used by pedestrians (who may continue to cross at grade). Grade-separated crossings can feel unsafe because pedestrians are isolated from others. The design of pedestrian grade-separated crossings should be consistent with guidelines for Caltrans Class I pathways, in terms of width, grade, lighting, surfaces, and other characteristics.

⁷ Hubbard, S, Bullock, D and J. Thai, Trial Implementation of a Leading Pedestrian Interval: Lessons Learned, ITE Journal, October 2008, pp. 32-41.

- ▶ Caltrans Highway Design Manual, Bikeway Planning and Design
www.dot.ca.gov/hq/oppd/hdm/pdf/chp1000.pdf
- ▶ Walkinginfo.org: Pedestrian Overpasses/Underpasses
www.walkinginfo.org/engineering/crossings-overpasses.cfm

Lighting

Safe sidewalks are a primary component of good pedestrian environments, and well lit environments convey a feeling of comfort and safety, particularly at night. Lighting should be located in the furnishings and/or frontage zones of the sidewalk, and at all roadway crossings to increase pedestrian visibility. Lighting is also an important element for multi-use pathways, at underpasses and other isolated locations. Lighting should be scaled for pedestrians.

- ▶ City of San José pedestrian-oriented practices
www.sanjoseca.gov/clerk/cp_manual/CPM_4_2.pdf
- ▶ San Francisco Better Streets Plan
www.sfgov.org/site/uploadedfiles/planning/Citywide/Better_Streets/Draft_BSP_6_Streetscape%20Elements.pdf

Traffic calming

Traffic calming is a traffic engineering technique that prioritizes people over motor vehicles in the design of neighborhood streets. Traffic calming measures are intended to enhance pedestrian safety and comfort and encourage safe driving by slowing vehicles and reducing cut-through traffic on local neighborhood streets.

Traffic calming tools include raised crosswalks, curb extensions, chicanes, chokers, pedestrian refuge islands, medians, traffic circles and roundabouts, speed humps, and radar speed displays. Traffic calming may also involve total reconfiguration of roadway lanes, such as four-lane to three-lane conversions (or “road diets”), which can also provide opportunities to add bike lanes and median refuge islands along a corridor.

There are pros and cons to each traffic calming tool. For instance, speed humps may slow vehicle speeds at that location, but may contribute to speeding between humps and may increase emergency vehicle response times. Chicanes and chokers (refer to *Glossary* for definitions)

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may slow traffic and provide reduced crossing distances for pedestrians, but may present obstacles to cyclists if not properly designed. Traffic calming may also slow transit vehicles.



Traffic circle

Impacts related to the compatibility of traffic calming features such as bulb-outs and bicycle circulation are discussed in the *Designing Complete Streets* section of this chapter. Many jurisdictions in Alameda County have neighborhood traffic calming programs that provide a menu of potential devices and a procedure for determining the installation of each.

Model traffic calming plans or Neighborhood Traffic Management Plans, such as in Sacramento, establish procedures and criteria for installing traffic calming measures in a neighborhood, rather than at single-site. In addition to a range of traffic calming options, best practices also include a range of education, enforcement, and engineering strategies and tools.

The US Traffic Calming Manual (2009) presents a “how to” process for implementing a traffic calming program with practical guidelines and case studies.

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- ▶ US Traffic Calming Manual
www.planning.org/media/trafficcalming/
 - ▶ Traffic Calming for Communities
www.ite.org/traffic
 - ▶ Alameda County Neighborhood Traffic Calming Program
www.acgov.org/pwa/programs_services_traffic_calming_traffic_packet.pdf
 - ▶ Wisconsin Roundabout Guide
-

www.dot.wisconsin.gov/safety/motorist/docs/guide-wisdotrab.pdf

- ▶ Fehr & Peers online traffic calming guide
www.trafficcalming.org
 - ▶ City of Sacramento Neighborhood Traffic Management Program
www.cityofsacramento.org/transportation/traffic-engineering/trafficntmp.html
 - ▶ City of Lafayette Traffic Calming Guidebook
<http://lafayette.govoffice.com/vertical/Sites/%7BC1C49B72-3D02-4C7B-82A7-92186ABD75FF%7D/uploads/%7B8D435016-14D1-4D3D-A0CC-8076BD7D59AB%7D.PDF>
 - ▶ Street Trees and Safety
www.naturewithin.info/Roadside/LA%20Mag_Intersec%20of%20Trees%20and%20Safety.5.08.pdf
 - ▶ Skinny Streets and Fire Trucks
www.smartgrowth.umd.edu/pdf/ULI_SkinnyStreets.pdf
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MOTORIST AWARENESS OF PEDESTRIANS

The following links provide resources regarding methods to slow traffic and improve motorist awareness of pedestrians, such as innovative crosswalk and signage treatments.

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- ▶ The Effect of Crosswalk Markings on Vehicle Speeds in Maryland, Virginia, and Arizona (FHWA-RD-00-101, August 2000)
www.tfhrc.gov/safety/pedbike/pubs/0101.pdf
 - ▶ The Effects of Innovative Pedestrian Signs at Unsignalized Locations: A Tale of Three Treatments (FHWA-RD-00-098, August 2000)
www.tfhrc.gov/safety/pedbike/pubs/00-098.pdf
 - ▶ City of Boulder Crosswalk Compliance Studies & Treatment Implementation (2003 ITE Pedestrian Award Submittal)
www.bouldercolorado.gov/files/Transportation_Master_Plan/2003_ite_ped_award.pdf
-

Construction zones

An accessible alternate circulation path should be provided whenever pedestrian access in the public right-of-way is temporarily blocked by construction or maintenance. The removal, even for a short time, of pedestrian access, curb ramps, or street crossings may

severely limit or totally preclude pedestrians, especially those with disabilities, from navigating in the public right-of-way and/or from accessing adjacent properties.

- ▶ Pedestrian and Bicycle Facilities in Work Zones
http://safety.fhwa.dot.gov/ped_bike/univcourse/swl/ess12.htm



Never block pedestrian access during construction without providing an alternative path

Disabled access

AMERICANS WITH DISABILITIES ACT TRANSITION PLANS

In July 1990, the Americans with Disabilities Act (ADA) was enacted, providing rights and protections to individuals with disabilities in the areas of employment, telecommunications, state and local government services, and public accommodations. Title II of the ADA requires public entities to prepare and submit a “transition plan” which: a) identifies the alterations that are needed in order to make its facilities and programs accessible; and b) specifies how those alterations will be accomplished.

In addition to the requirements of the ADA, California Code Section 4450 requires that all publicly funded buildings, structures, sidewalks, curbs, and related facilities built or renovated after 1968 be accessible to and usable by persons with disabilities.

With respect to the pedestrian network, ADA transition plans must include a schedule for providing curb ramps where pedestrian walkways cross curbs. ADA transition plans should establish an ongoing procedure for installing curb ramps upon request in areas frequented

by residents, employees, or visitors with disabilities. Priority must be given to walkways serving government offices, public transportation, and other places of public accommodation. In the interest of promoting both accessibility and efficiency, the ADA allows public entities to avoid making a route accessible where there is an existing accessible route that is only marginally longer. In addition, the number of curb ramps required at a given intersection may be limited by “fundamental alteration and undue burden” limitations, which relieve jurisdictions from having to take actions that fundamentally alter the nature of its programs or result in undue financial or administrative burdens.

The above is not an exhaustive list of ADA transition plan requirements. Additional resources, such as those provided via links below, should be consulted.

- ▶ ADA Accessibility Guidelines homepage
www.access-board.gov/ada-aba/index.htm
- ▶ US Department of Justice ADA homepage
www.ada.gov/
- ▶ ADA Standards for Accessible Design
www.ada.gov/stdspdf.htm
- ▶ California Code Section 4450
<http://law.onecle.com/california/government/4450.html>

TOP 10 ADA MYTHS

Several commonly held “myths” are dispelled in the following sections:

1. ADA retrofits only benefit a small number of users.
2. Pushbuttons can be installed on the signal pole.
3. One pushbutton per corner is sufficient.
4. ADA transition plans don’t address sidewalks.
5. The walking speed is four feet per second.
6. Only one ramp per corner is needed.
7. It’s not in the travelway, so design doesn’t matter.
8. Use truncated domes only on curb ramps.
9. Audible signals are not required.
10. ADA doesn’t need to be met for every improvement.

ACCOMMODATING PEOPLE WITH VISUAL IMPAIRMENTS

People with visual impairments gather information about their traveling environment in different ways than fully sighted people, such as the sound of traffic, changes in slope such as are found on curb ramps, paving textures,

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and color contrast. Good design provides these cues. Any element used to help those with visual impairments should be used consistently throughout a jurisdiction. Moreover, predictability and a walking environment free of obstructions make navigation easier. Crosswalks that are at 90-degree angles to the roadway and provide simple crossing patterns are most easily discerned by pedestrians with visual impairments.

Raised tactile devices (“truncated domes”) 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. Less expensive alternatives to truncated domes are grooves or indentations at the top of curb ramps; however, such treatments are not detectable with a cane unless the cane has constant contact with the sidewalk. For pedestrian facilities along Caltrans highways, Caltrans requires grooves to form a 12-inch (300 mm) border, measured from the level surface of the sidewalk.

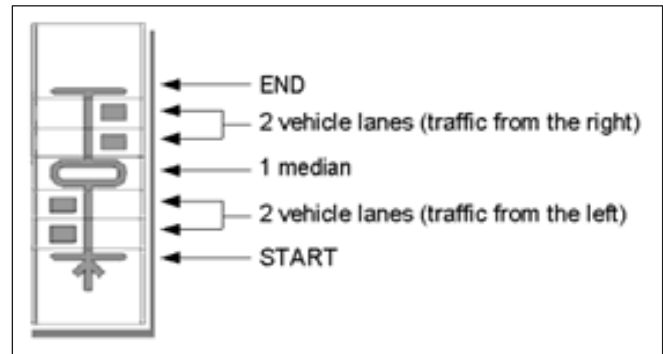


Source: Transportation Research Board

Audible pedestrian signals (APS) may also be used to assist people with visual impairments. APS emit a sound such as a bell, buzz or chirp, which indicates to the user that they have a WALK signal and in which direction of travel (indicated by different tones). The installation of APS presents an additional cost, but makes intersections safer for visually impaired pedestrians. The volume of audible pedestrian signals is generally adjustable and should be set to emit a lower-volume sound at night when traffic levels and ambient noise are low. New technologies can automatically adjust a signal’s volume,

according to the ambient noise, and direct it towards waiting pedestrians. Additional APS innovations include:

- “Walk” voice and distinctive tone
- Oversized arrow and button
- Vibrating arrow
- Vibrating arrow and tone



Tactile maps may also be placed at crossings to provide information regarding number of lanes and presence of a median. All of these devices benefit all pedestrians eventually, since vision becomes poorer with increased age.

▶ Accessible pedestrian signals

www.walkinginfo.org/aps/appendix_a_ncutcd.cfm

▶ Accessible Design for the Blind’s *Accessible Pedestrian Signals*

www.acb.org/pedestrian/signals.html

CURB RAMPS

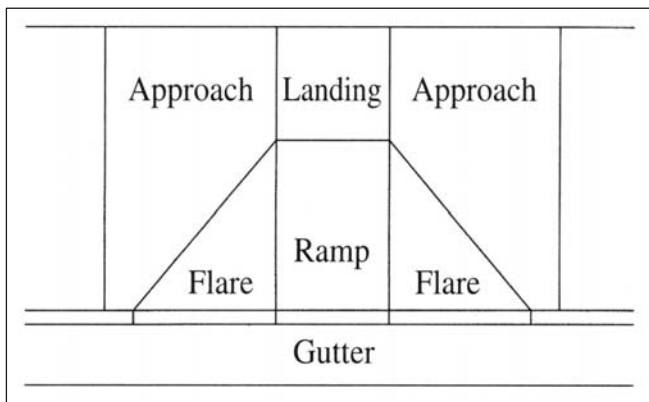
Curb ramps provide access to wheelchair users and others who need a gradual transition, rather than a sudden step, to move between the sidewalk and roadway levels. They also help others with mobility impairments, strollers or rolling carts to traverse easily between sidewalk and crosswalk. The Americans with Disabilities Act requires ADA-compliant curb ramps at all intersections.

Curb ramp components include the ramp itself, a landing at the top of each ramp, approaches on either side of the landing, flares or sloped transitions between the curb and sidewalk, and the gutter between the ramp and the street. Wherever space and budget permit, two curb ramps per corner are recommended to allow a direct path into the

crosswalk and to minimize the time spent in the roadway.

ADA requires that transitions from ramps to gutters and streets to be flush and free of abrupt changes. ADA-compliant ramps must be 36 inches wide, exclusive of flared sides, and should have a detectable warning system, such as truncated domes, extending the full width and depth of the curb ramp. The smallest possible slope should be used for all ramps. See ADA guidelines (link below) for additional information regarding slope, grade and other requirements.

While curb ramps provide access to those with mobility impairments, they may have the opposite effect for visually-impaired pedestrians, who may have trouble detecting the gentle slope of a curb ramp. For these reasons, curb ramp and intersection design for ADA compliance must accommodate both mobility- and visually-impaired users. Well-designed curb ramps provide a gentle slope for wheelchair users and those with crutches, canes, or other walking aids as well as a tactile cue (such as truncated domes or another detectable warning surface) for those who cannot see the curb ramp. *Designing Sidewalks and Trails for Access*, published by the Federal Highway Administration, provides design guidelines for accessible curb ramp and intersection design.



Curb ramp components

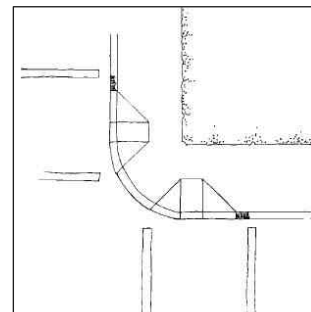
As noted above, jurisdictions should develop a schedule or process for upgrading existing non-ADA compliant intersections with curb ramps as part of their transition plans. When streets, roads, or highways are newly-built or altered, they must be ADA-compliant wherever there are curbs or other barriers to entry from a sidewalk or path. Likewise, when new sidewalks or paths are built, the ADA requires that they contain curb ramps or sloped

areas wherever they intersect streets, roads or highways. Resurfacing beyond normal maintenance is considered an alteration, which triggers the ADA; however, filling potholes is considered normal maintenance and does not.

- ▶ [Designing Sidewalks and Trails for Access](http://www.fhwa.dot.gov/environment/sidewalk2/index.htm)
www.fhwa.dot.gov/environment/sidewalk2/index.htm
- ▶ [ADA guidelines](http://www.access-board.gov/adaag/html/adaag.htm)
www.access-board.gov/adaag/html/adaag.htm
- ▶ [City of Sacramento ADA curb ramp guidelines](http://www.ci.sacramento.ca.us/dsd/development-engineering/documents/Ped_Safety.pdf)
www.ci.sacramento.ca.us/dsd/development-engineering/documents/Ped_Safety.pdf

Types of curb ramps

There are a number of different types of curb ramps: perpendicular, diagonal, parallel, built-up ramps with curb extensions, and depressed corners. The type of curb ramp selected should correspond to the design requirements of a given location. A routine practice of one curb ramp per crosswalk is desirable wherever feasible.



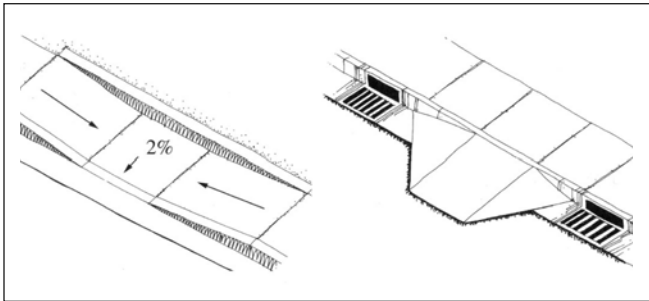
Perpendicular curb ramps allow for a convenient, direct path of travel in a 90-degree angle to the curb. Perpendicular ramps provide maximum capacity for pedestrians at intersections and minimum street-crossing distances where two

ramps are provided at each corner (the recommended practice). Where sidewalks are narrow, adding curb extensions can create additional space to accommodate two perpendicular ramps and landings. Perpendicular curb ramps without level landings can be difficult for wheelchair-users to negotiate. Providing two perpendicular ramps at each corner, one for each direction of travel across the street, requires more space and is more costly than single diagonal ramps.

Diagonal curb ramps are single curb ramps at the apex of the corner. They cause pedestrians to travel towards the center of the intersection before entering the crosswalk, thus exposing them to greater risk of collision with vehicles. This situation is particularly hazardous for visually-impaired pedestrians. Diagonal curb ramps cost less to construct than perpendicular ramps since only one is required per corner.

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Parallel curb ramps are oriented parallel to the street. They are generally used on narrow sidewalks where there is inadequate width to install other ramps. Parallel curb ramps require pedestrians who are continuing along the sidewalk to ramp down and up. Parallel curb ramps may be used at either corner or mid-block locations.



Parallel (on left) and Built-up Curb Ramps (on right)

Built-up curb ramps project from the curb into the gutter and street, although they can begin their slope within the sidewalk. These curb ramps are generally not recommended, but may be needed where no other option is feasible. Like perpendicular ramps, built-up ramps should be oriented at 90 degrees to the street. Built-up curb ramps may be used at corner or mid-block locations. Since they extend into the roadway, built-up curb ramps must be designed with provisions for drainage. Perpendicular ramps on curb extensions are preferable to built-up curb ramps.

Depressed corners gradually lower the level of the sidewalk through a slope that meets the grade of the street. Depressed corners offer the same advantages as perpendicular curb ramps, assuming there are two per corner. However, they are generally not recommended since they make it difficult for people who are visually or cognitively impaired to distinguish the transition from sidewalk to street. Depressed corners can also confuse guide dogs. Motor vehicles also sometimes encroach onto depressed corners. For these reasons, existing depressed corners 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.

STATE AND FEDERAL GUIDANCE/RECOMMENDATIONS

With the exception of the curb ramp requirements, accessibility standards specifically applicable to public sidewalks and other features of the public right-of-way have not yet been adopted by the US Department of

Justice. The ADA Accessibility Guidelines (ADAAG) currently call for curb ramps at all locations where an accessible route crosses a curb to comply with the following guidelines:

- 1:12 maximum slope.
- 1:20 maximum slope for adjacent surfaces.
- 1:10 maximum slope for flared sides.
- 36" minimum width
- Flush transition between ramp and street

The ADAAG also requires installation of detectable warnings when constructing or modifying curb ramps: "Detectable warnings shall consist of raised truncated domes with a diameter of 23 mm, a height of nominal 5 mm and center to center spacing of nominal 59 mm and shall contrast visually with adjoining surfaces, either light-on-dark or dark-on-light." Detectable warnings are placed 0.6 m deep at the base of curb ramps or on the sidewalk edge of the street at blended curbs and at flush transitions from the sidewalk to the crosswalk. Alignment of domes is parallel to the primary direction of travel.

ADAAG standards for wheelchair passage widths and accessible routes include a minimum continuous wheelchair passage width of 36 inches, 32 inches at a point, and no changes in level greater than ½ inch without a ramp. In the absence of adopted ADAAG public right-of-way standards, these clear width and other accessible route standards are being used by many jurisdictions as minimums for ADA compliance on sidewalks and other areas of the public right-of-way. Case law (*Barden v. City of Sacramento*) supports this, as the Ninth Circuit Court of Appeal held that the sidewalks are subject to the ADA's accessibility requirements.

The U.S. Access Board has published Draft Guidelines (the Public Rights-of-Way Access Advisory Committee's (PROWAAC) *Special Report: Accessible Public Rights-of-Way Planning and Design for Alterations*) for accommodating pedestrians with disabilities. The Guidelines cover pedestrian access to sidewalks and streets, including crosswalks, curb ramps, street furnishings, pedestrian signals, parking, and other components of public rights-of-way. The Guidelines are awaiting formal publication as a regulation from the Department of Justice, at which point they would become a supplement to the ADAAG. Design in accordance with the Guidelines is considered the current best practice.

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- ▶ Draft Public Right of Way Guidelines
www.access-board.gov/provac/index.htm
 - ▶ Federal Highway Administration Accessibility Guidance
www.fhwa.dot.gov/environment/bikeped/guidance.htm
 - ▶ Access Board guidelines for public rights-of-way and transportation
www.access-board.gov/pubs.htm
 - ▶ USDOT Access to Transportation
www.dot.gov/citizen_services/disability/disability.html
 - ▶ California Disability Access website
www.disabilityaccessinfo.ca.gov/default.htm
 - ▶ Accessible Public Rights-of-Way: Planning and Designing for Alterations (2007)
www.access-board.gov/provac/alterations/guide.pdf
-

Designing complete streets

Many modes of transportation use the public right of way alongside pedestrians. While there are inherent conflicts in the way each mode uses the roadway, good design can help mitigate and reduce potential conflicts. “Complete Streets” is a term that emphasizes design of the roadway network that considers all users, not just motor vehicles. A complete street provides a safe facility for the movement of pedestrians, bicyclists, motor vehicles and transit riders of all ages and abilities.

-
- ▶ Information on complete streets
www.completestreets.org
-

Specific pedestrian issues and elements to be considered when planning for other roadway users are described below.

AUTOS

Reducing pedestrian-vehicle conflicts should be a primary goal of any transportation or land use design. A well-designed system provides safe and efficient mobility for both automobiles and pedestrians, with minimum conflict points. The following are locations where pedestrians and vehicles often come into conflict, and some ways to minimize these conflicts.

Freeway interchanges

Freeway interchanges with free right turn on-ramps are a common point of conflict as vehicles are transitioning to/from freeway speeds. Safe pedestrian crossings should be encouraged by realigning ramps to be closer to perpendicular to the roadways (tighter turning radii), using clear signage and striping, alerting motorists to the presence of pedestrians, and channeling pedestrians to cross on- and off-ramp lanes perpendicular to the flow of traffic.

High-speed arterials

Crossing high speed arterials can be daunting and dangerous to pedestrians. Walking alongside these roadways can be unpleasant if no buffer zone is provided between the sidewalk and the roadway. In order to make high speed arterials more comfortable for pedestrians, sidewalk areas can be landscaped to provide some separation between the roadway and the sidewalk’s through zone. (See *Sidewalks* section earlier in this chapter.) Pedestrian refuges or medians should be provided at crossings of high speed arterials to reduce both the time needed to wait for a crossing interval and the distance the pedestrian must cross at one time. (See *Street Crossings* section, above.)

Parking lots, driveways and garages

Parking lots and driveways are potential conflict points for pedestrians, as motorists may be looking for parking spaces, or for a gap in traffic, instead of looking for pedestrians. Warning signage located near driveways can alert motorists to the presence of pedestrians. Pathways through parking lots can separate pedestrians and crosswalks striped to indicate the best crossing locations for pedestrians. Unique paving treatments where driveways cross sidewalks can also be helpful to alert motorists. Garage entrances and exits pose unique difficulties due to the lack of visibility between pedestrians and drivers. Speed humps can be used to slow cars entering and exiting garages and care can be taken to improve sightlines for motorists. Relying on horns and lights to alert pedestrians to exiting cars is not recommended.

ACCESS TO TRANSIT STOPS AND STATIONS

Public transit is an integral part of pedestrian-friendly communities. Transit increases the length and variety of possible pedestrian trips, making it possible for people to choose walking as their transportation mode more frequently. Many transit users walk to stations and stops, so there is great need for good pedestrian design

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leading to these locations. In 2004, AC Transit published *Designing with Transit: Making Transit Integral to East Bay Communities*, a handbook for designing transit-friendly communities. The guide lists the characteristics of a pedestrian-friendly community and includes guidelines pertaining to walk access to AC Transit bus stops. These include:

- Provide sidewalks, of sufficient width, on all streets leading to bus stops and assure that sidewalks are wide and clear enough to accommodate bus passengers without blocking through pedestrian traffic;
- Design blocks in a grid pattern, connected to other streets;
- Construct short blocks of no more than 500 feet;
- Develop pedestrian pass-throughs where blocks are long or end in cul-de-sacs;
- Provide direct access from activity centers to bus stops;
- Site stops in the best operational locations, usually on the far side of intersections;
- Site stops where passengers are less likely to become victims of crime;
- Install bus bulbs where they facilitate bus operation and pedestrian capacity;
- Provide adequate lighting and clear sight lines on sidewalks and pathways;
- Make sidewalks and paths visually interesting and active;
- Provide ADA-compliant bus boarding and alighting areas of at least eight feet by five feet;
- Site buildings next to the sidewalk and minimize setbacks;
- Ensure that buildings have entrances directly from the sidewalk;
- Provide pedestrians with safe crossings of major streets, installing traffic signals where necessary for pedestrian safety;
- Minimize roadway crossing distances without compromising bus operations;
- Limit vehicle turning movements across active sidewalks and walkways; and
- Locate parking to minimize interference with people walking to building entrances.

► *Designing with Transit*
www.actransit.org/pdf/designing_with_transit.pdf

► *Pedestrian Safety Guide for Transit Agencies*
http://safety.fhwa.dot.gov/ped_bike/docs/fta.pdf

BICYCLES

Although pedestrians and bicyclists are often grouped together, each mode has distinct needs. In some cases, improvements to one mode will benefit the other. For example installing bike lanes (or wide curb lanes) provides not only a dedicated space for bicycles, but also offers a buffer between pedestrians and motor vehicles. There are also instances where facilities for one mode may conflict with the other if they are not properly designed. The *Alameda Countywide Bicycle Plan* provides the following strategies for addressing potential bicycle and pedestrian design conflicts:

Designing for both modes along streets: Both bicyclists and pedestrians should be able to safely travel on or along a roadway. If there is sufficient right-of-way along an arterial, both a bike lane and sidewalk should be provided. However, along streets with limited rights-of-way where sidewalks and bike lanes cannot both fit, sidewalks should be provided and bicyclists should be accommodated on the roadway.

Provide separate entrances for bicyclists and pedestrians: At entrances to transit stations and other major attractors, pedestrians and bicyclists should have separate pathways, or bicyclists should be directed to enter via the roadway.

► *Alameda Countywide Bicycle Plan*
www.accma.ca.gov/pages/HomeBicyclePlan.aspx

The following are additional areas of potential conflict between bicyclists and pedestrians, and possible ways to avoid these conflicts.

Curb extensions and median refuge islands

If designed improperly, some pedestrian-friendly infrastructure, like curb extensions or median refuge islands, may conflict with bicycle travel. Devices that extend into the path of bicycle travel (e.g. curb extensions that extend into the bike lane) require bicyclists to suddenly enter the traffic to avoid them. Curb extensions

should never extend into a bike lane (generally they should line up with the edge of the parking lane). When designing medians and other devices, consideration should be given to ensuring sufficient “shy distance” so that motorists do not veer into the bicycle lanes.



Bike rack positioned to avoid interference with pedestrian activity

Bicycle parking/sidewalk access

California Vehicle Code Section 21210 prohibits bicycle parking on sidewalks in a manner which inhibits pedestrian right-of-way. Bicycle parking facilities, such as racks and lockers, should be located in a manner which maintains a clear “through zone” for pedestrians.

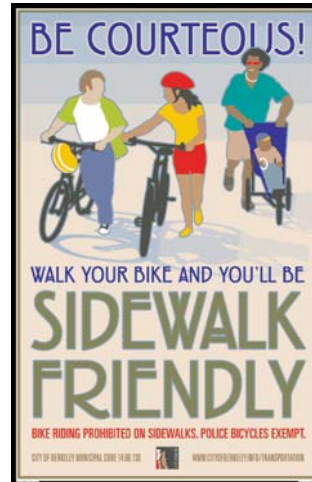


Bike lockers at transit stations should be located to avoid interference with pedestrian activity

The *Alameda Countywide Bicycle Plan* states that bicycle parking should be located so that it does not interfere with pedestrian circulation, especially in parking lots, near building entrances, and on sidewalks. The Plan recommends five feet of clear space between a parked bicycle and other obstructions. The City of Oakland has

detailed placement standards for installing bike racks on public sidewalks, including maintaining a minimum of 5.5 feet of clear space for pedestrian travel outside of the rack footprint (seven feet in areas of heavy pedestrian traffic).

- City of Oakland bicycle rack placement standards www.oaklandpw.com/Asset131.aspx



Bicycling on Sidewalks
Bicycling on sidewalks is prohibited by most jurisdictions, usually with the exception of children under the age of 12 who travel more slowly than the speed of vehicular traffic. Adult cyclists should be prohibited from riding on sidewalks due to the potential for conflict with pedestrians (especially those in wheelchairs or with strollers), as well as the increased potential for bicycle-vehicle conflicts at driveways and intersections.

The *Alameda Countywide Bicycle Plan* provides the following strategy for addressing bicycling on sidewalks:

Discouraging bicyclists from riding on the sidewalk: This can be accomplished by providing appropriate places to ride. For example, bike lanes on arterials will discourage bicyclists from riding on the sidewalk. Providing parallel bike routes on calmer streets will also reduce the incidence of sidewalk riding. For information about bicycle collisions due to riding on sidewalks, see the links below.

- Information on bicycle collisions due to sidewalk riding www.chp.ca.gov/html/bicycleriding.html
- <http://bicyclesafe.com/>

In the early 2000s, the City of Berkeley conducted a pilot program called “Walk Bikes on Sidewalk, Ride Bikes on Street,” designed to increase public safety and reduce conflicts between pedestrians and bicyclists and between

Design Standards

motorists and bicyclists. The project's goal was to better inform bicyclists, pedestrians, and motorists that the Berkeley Municipal Code requires that bicycles be walked on the sidewalk or ridden on the street with traffic flow. The program included mounted traffic signs, sidewalk stencils at curb ramps, posters and police enforcement. Preliminary study results showed a ten percent reduction in sidewalk-riding (as a percentage of all on-street and sidewalk bicyclists at a given location) over nearby locations without signage.

- City of Berkeley's "Walk Bikes on Sidewalk, Ride Bikes on Street" program
www.ci.berkeley.ca.us/contentdisplay.aspx?id=6654

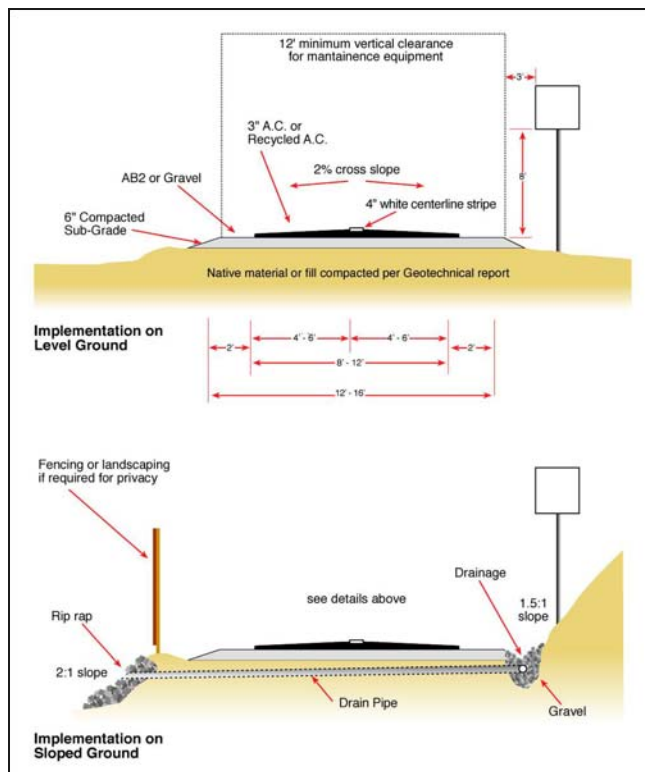
Multi-use trails

Optimal designs for multi-use trails, often called Class I pathways, allow diverse user groups to use trails simultaneously. Trail width is an essential component of good multi-use trail design. Caltrans standards require a minimum eight-foot paved width, with two-foot unpaved shoulders on each side. Twelve-to-18 feet of paved width is recommended where large volumes of bicyclists and pedestrians are expected to prevent user conflicts when cyclists, traveling at higher speeds, encounter families with young children or strollers, or other pedestrians walking side by side on the trail. Additionally, good Class I trail design goes beyond the Caltrans requirement of a two-foot soft shoulder on each side of the trail, and provides a soft shoulder of up to four feet for those who prefer to jog or walk on an unpaved surface. The East Bay Regional Park District uses a minimum standard of 10 feet with two-foot gravel shoulders on each side.

The *Alameda Countywide Bicycle Plan* provides the following strategies for accommodating bicycles and pedestrians on multi-use trails:

- Shared-use pathways that will have significant volumes of both bicyclist and pedestrians should have a paved width of at least 12 to 18 feet, to allow for both pedestrians and bicyclists. Ideally, two separate pathways are provided, one for each mode.
- Where the Caltrans Highway Design Manual minimum standard is provided, signs should be posted advising cyclists to pass on the left and to call out when passing, and for pedestrians to keep to the right.

- Providing a graded shoulder will help to reduce conflicts because many runners and walkers prefer to walk on the softer surface. This increases the effective width of the pathway by allocating more paved width to bicyclists. Wider facilities may be substituted for graded shoulders.



Typical Multi-Use Path Cross Section

Where pedestrians and bicyclists are provided separate trails, in order to encourage each user group to remain on the path intended for them, both paths should be equally well-designed and maintained. For instance, pedestrians often choose a straight path over one that meanders.

- Caltrans Guidelines
www.dot.ca.gov/hq/oppd/hdm/pdf/chp1000.pdf
- Alameda Countywide Bicycle Plan
www.accma.ca.gov/pages/HomeBicyclePlan.aspx

Separated bikeways

Separated bikeways or cycle tracks are another type of Class I facility that has been popular in Europe for some time and is gaining support in the United States. No US design guidelines are currently in place for this type of

facility, but the ITE Pedestrian/Bicycle Council is anticipating research in this area. Since the facilities are typically for bicycles only, design guidelines will need to address pedestrian accommodations, especially at crossings.



Ninth Avenue separated bicycle path, New York City (2008); Streetsblog.org

Crime reduction

Social cohesion among neighbors has long been studied and connected to reduced levels of crime in neighborhoods. Researchers have discovered the key factor in determining whether people are willing to watch out for one another is whether there is a sense of community in the study locations. Community spirit and a willingness to get involved have been found to reduce crime by as much as 40 percent. Thus, providing places and reasons for people to come together, is key to creating safe communities. Pedestrian-oriented design elements such as pocket parks, corner stores, community gardens, shared courtyards, maintained properties, windows (“eyes on the street”), and narrow streets with little traffic, can all contribute to a sense of community found in safe, low-crime neighborhoods.

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- ▶ Land Use Planning for Safe, Crime-Free Neighborhoods: Local Government Commission Fact Sheet
www.lgc.org/freepub/docs/community_design/focus/plan_safe_neighborhoods.pdf
 - ▶ Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy
<http://crab.rutgers.edu/~goertzel/NeighborhoodsCrimeEarls.html>
-

Checklist for pedestrian items to include in any roadway project

This checklist is a recommended list of items to accommodate pedestrian safety and to provide convenient pedestrian access that should be considered in any roadway project. Caltrans Complete Streets policy (Deputy Directive 64) requires the needs of pedestrians to be accommodated in all planning and design of roadway projects (refer to *Designing Complete Streets* section of Chapter 2). Using the following guidelines will help to meet the requirements of the directive.

- Continuous and straight sidewalks on both sides of all roadways, with unobstructed "clear zones" (the minimum required width is 4' (with 5' passing areas), but 6' is a preferred minimum, if feasible);
- An access management plan that minimizes the number of driveways;
- A planting strip with landscaping and street trees. (At a minimum, a 2' wide strip should be considered, but 4' or more is preferred if feasible);
- On-street parking;
- Adequate sidewalk lighting;
- Well designed, ADA-compliant intersections (to the extent allowed by available right-of-way), including:
 - Two perpendicular curb ramps on each corner;
 - High-visibility marked crosswalks;
 - Short wait time between opportunities to cross at intersection (consider 60 seconds or less);
 - Median refuges & curb extensions such that pedestrians have a reasonable distance to cross at one time (consider a maximum of 40');
 - Audible countdown pedestrian signal heads on major roadways;
 - Tight curb radii;
 - Attractive amenities such as benches, artwork, drinking fountains, and shade trees, as warranted by demand and weather; and
 - Consider mid-block crossings on longer blocks (over 500' long)

The following specialized checklist can also be useful:

-
- ▶ Pedestrian Safety Assessment walkability checklist
www.techtransfer.berkeley.edu/tse/psa_handbook.pdf
-

Site design checklist

This checklist provides features to consider in new development in order to facilitate safe and convenient pedestrian access. The list addresses both residential and commercial development.

- Mixture of commercial and residential uses that allows for walking from homes to shopping and other destinations;
- Alleyways with off-street parking behind houses to allow sidewalks to be unbroken by driveways;
- Local streets designed for very slow motor vehicle traffic (20 mph or less), complete with:
 - Continuous and straight sidewalks on both sides of all roadways, with unobstructed "clear zone" (the minimum required width is 4' (with 5' passing areas) but 6' is a preferred minimum if feasible);
 - A planting strip with landscaping and street trees (at a minimum, a 2' wide strip should be considered, but 4' or more is preferred if feasible);
 - On-street parking; and
 - Adequate lighting of sidewalks.
- Short blocks to ensure frequent pedestrian crossing opportunities (consider less than 400');
- Attractive amenities, such as benches, artwork, drinking fountains and shade trees;
- Buildings placed at the sidewalk/property line, or no farther back than ten feet from the sidewalk edge;
- In commercial areas, reduce visual impact of parking lots, blank walls and other "dead space;"
- Well-designed garage entrances and exits that maximize driver and pedestrian visibility and minimize speeds;
- Intersperse parks, plazas and other public spaces with commercial, mixed use, and residential development, thereby contributing to the aesthetic appeal of the pedestrian environment and providing destinations for those walking for recreation or exercise; and
- Legible signage, especially in commercial areas, that directs pedestrians to nearby destinations.

The following specialized checklist can also be useful:

-
- ▶ Smart Growth checklist (from City of Sacramento)
www.cityofsacramento.org/transportation/dot_media/street_media/sac-ped-plan_9-06.pdf
-

Practices to be avoided when designing transportation projects

This checklist identifies a list of common design practices that reduce pedestrian access and discourage walking. These practices should be avoided when designing transportation facilities that do not prohibit pedestrians, such as freeways.

- Allowing transit stops to be disconnected from the pedestrian environment, such as where there are no sidewalks;
- Single point urban interchanges ("SPUIs"), which have wide intersections and multiple turn lanes, hindering safe pedestrian crossings;
- Complex intersections, which are difficult for pedestrians and motorists alike to understand and use, and which create potential conflicts;
- Wide intersections, which expose pedestrians to greater risk of collision with motor vehicles. Consider creating crossing segments that are each not more than approximately 40 feet in length using refuge islands;
- Free right turn lanes, which allow motorists to turn right on a red light without stopping;
- Large curb radii, which allow turns to be made at high speeds. Consider curb radii of 15 feet or less, as circumstances allow;
- Rough surfaces which may present difficulty for disabled pedestrians;
- Long distances (greater than 500 feet) between marked pedestrian crossing locations;
- Double right or left turn lanes, which restrict the ability of motorists on the inside turn lane to see pedestrians; and
- Frequent driveways that break sidewalk continuity.

4. Education and Encouragement Programs

CHAPTER GUIDE

TOPIC: Innovative techniques and programs to promote walking.

AUDIENCE: Community-based organizations, community members, pedestrian advocates and policy makers.

MODEL PROMOTION AND EDUCATION PROGRAMS

Pedestrian promotions encourage people to walk, either for transportation, recreation, health or all of these. Promotions can be for a limited time period – such as an annual walkathon or a monthly walk commute day – but can also seek to establish or improve long term walking habits. Pedestrian education programs typically teach pedestrians how to walk safely and/or teach drivers how to interact safely with pedestrians. Examples include driver education programs as well as Safe Routes to Schools programs that show children and their parents safe paths and how to look out for cars.

Individualized marketing

Programs that use this technique offer residents or employees of targeted areas or sites information about alternatives to the single-occupant vehicle, including walking. These programs have been shown to be very effective at influencing participants' behavior, particularly by shifting from driving to walking for short trips. Two examples are:

Ten Toe Express in Portland, Oregon

The Eastside Hub program – co-sponsored by the City of Portland and Kaiser Permanente in 2005 – promoted the transportation and health benefits of a more active lifestyle. One centerpiece of the campaign was the “Ten Toe Express” walking kit, which included a digital pedometer to count one’s steps, the Southeast Portland Walking Map, a guided walk schedule, and a coupon book for local businesses with over \$100 in savings. Five thousand walking kits were distributed through direct mail orders to residents of the Eastside Hub Target Area in southeast Portland who requested them. Follow-up personalized phone calls and e-mails helped encourage residents to use the materials. Program evaluation shows that the share of trips made on foot increased by seven percent in six months.

► City of Portland, Ten Toe Express
www.portlandonline.com/transportation/index.cfm?c=djdbf

TravelChoice in the San Francisco Bay Area

TravelChoice, a one-on-one marketing program led by TransForm, was originally patterned after Portland’s TravelSmart program. Initial phases of the program focused on outreach to residents in Oakland’s Fruitvale district, the east end of the City of Alameda, and multiple Berkeley neighborhoods, where short-range success was demonstrated. The next generation of the TravelChoice program will be a development-oriented pilot program. Anticipated for launch in Spring 2010, the program will offer one-on-one marketing to residents of new developments, beginning as early as the entitlement phase of the development. In this way, the program seeks to attract “eco-oriented residents” to “eco-oriented developments,” making the most of new smart growth and transit-oriented development projects around the Bay Area. Outreach is also planned to be offered

Education and Encouragement Programs

proactively within these developments each year, as new residents arrive and travel choices change. The pilot will take place in Alameda County with regionwide implementation planned in later phases.

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- ▶ TransForm
www.transformca.org
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Other educational programs

Walkable community workshops/walkability audits

This professionally-led workshop/walking tour combination is aimed at broadly assessing pedestrian facilities in a focused area and identifying specific improvements that would make the area safer, more attractive and more convenient to pedestrians. Participants include local transportation engineers, planners, elected officials, pedestrian advocates and neighborhood residents. Several trained workshop leaders are based in the Bay Area and can be contacted via the California Center for Physical Activity link below. The workshop cost is very affordable for local agencies.

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- ▶ California Center for Physical Activity
www.caphysicalactivity.org/wcw.html
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Safe Moves

Safe Moves is a private organization that leads school-based workshops, including traffic rodeos (demonstrations of proper pedestrian and bicycle safety techniques), in-class instruction that features exhibits and simulations demonstrating dangerous traffic situations, and informational and promotional items. It is used locally in Fremont, and is fee-based.

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- ▶ Safe Moves
www.safemoves.org/smart_moves.htm
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Public service announcements, campaigns and brochures

One of the most cost-effective methods of encouraging and educating pedestrians is through the existing television public service announcements made available through the National Highway Transportation Safety Administration (NHTSA), Safe Kids Coalition, and the California Office of Traffic Safety (OTS). These agencies provide announcements on pedestrian safety for seniors,

the general public, and children and families, as well as driver education on pedestrian safety, intersection safety, and red lights.

Campaigns include advertisements on buses and bus shelters, in-school curricula, community school courses, and/or brochures, among many other strategies. The Street Smarts program in San José, California, provides a model pedestrian safety education program.

The Bicycle Transportation Alliance has developed a pedestrian safety curriculum for second and third graders, which incorporates physical education, health, and social responsibility

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- ▶ NHTSA Pedestrian Safety Program
www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.dfed570f698cabbbf30811060008a0c/
 - ▶ Safe Kids Coalition
www.safekids.org
 - ▶ California Office of Traffic Safety
www.ots.ca.gov
 - ▶ San José Street Smarts Program
www.getstreetsmarts.org
 - ▶ Bicycle Transportation Alliance Pedestrian Safety Curriculum
www.bta4bikes.org/docs/PedSafetyCurriculumFinal.doc
 - ▶ Other safety curriculum resources
www.saferoutespartnership.org/state/5638/5722
 - ▶ Pedestrian safety brochures
<http://safety.fhwa.dot.gov/media/brochures.htm>
 - ▶ AAA Foundation for Traffic Safety Product Catalog (brochures, posters, videos, etc.)
www.aaafoundation.org/pdf/catalog2006.pdf
-

SAFE ROUTES TO SCHOOLS PROGRAMS (SR2S)

Safe Routes to Schools refers to a variety of multi-disciplinary programs aimed at promoting walking and bicycling to school, and improving traffic safety around school areas through education, incentives, law enforcement, and engineering measures. Safe Routes to Schools programs typically involve partnerships among

municipalities, school districts, community and parent volunteers, and law enforcement agencies. Safe Routes to Schools programs are often described in terms of the “Four E’s:”



Education – Students are taught bicycle, pedestrian and traffic safety skills, and educational campaigns aimed at drivers are developed.

Encouragement – Events and contests such as walkathons are used to encourage more walking, bicycling, or carpooling through fun and incentives.

Enforcement – Various techniques are used by law enforcement to ensure that traffic laws are obeyed, such as traffic stings targeted at pedestrian safety and speed feedback trailers.

Engineering – Signing, striping, and infrastructure improvements are implemented along school commute routes.

TransForm, a Bay Area-wide organization working to create walkable communities, manages the Safe Routes to Schools Alameda County Partnership, a program that provides resources and coordination for SR2S programs at elementary schools throughout the county. ACTIA is a major funder of this program.

Funding for Safe Routes to Schools programs and/or projects is available at the state and federal levels. The National Center for Safe Routes to School, established in 2006, provides extensive resources on programs, training, funding, evaluation, and grant writing.

- ▶ Safe Routes to Schools Alameda County
www.transformca.org/campaign/sr2s
- ▶ National Center for Safe Routes to School
www.saferoutesinfo.org
- ▶ FHWA’s Safe Routes to School website
<http://safety.fhwa.dot.gov/saferoutes>
- ▶ Detailed instructions for developing SR2S programs
www.nhtsa.dot.gov/people/injury/pedbimot/bike/Safe-Routes-2002/
- ▶ California’s Safe Routes to School efforts
www.dot.ca.gov/hq/LocalPrograms/SafeRTS2School/TransportationToolsforSR2S.pdf
- ▶ Oakland’s SR2S Toolkit
www.oaklandnet.com/government/Pedestrian/saferoutetk.html

BENEFITS OF A SR2S PROGRAM

The comprehensive nature of SR2S programs – based on a cooperative effort between school officials, parents, residents, and city staff – increases the likelihood of implementation of infrastructure improvements and education and enforcement programs needed to make walking and bicycling safer in the vicinity of schools. The benefits of a successful SR2S program include:

Safety

The primary benefit of implementing a SR2S program is the resulting increase in safety for children walking and bicycling to school. These benefits extend to all pedestrians in the vicinity of schools.

Health

By making improvements that encourage students to walk and bike to school, SR2S programs help integrate physical activity into the everyday routine of school children. Health concerns related to sedentary lifestyles have become the focus of statewide and national efforts to reduce health risks associated with being overweight.

Traffic and air quality

Encouraging children to walk or bike to school can have a substantial impact on traffic volumes (as much as a 30 percent reduction in AM peak hour traffic when parent drop-offs are replaced with non-motorized travel) and the production of greenhouse gases and other pollutants.

Education and Encouragement Programs

Independence

Walking and biking to school can provide a sense of independence for children who may otherwise be restricted by school buses or parents' schedules. Beyond protecting students, greater enforcement of traffic laws, educating the public and exploring ways to create safer streets provide confidence to parents that their children will be safe getting to school on their own.

ESSENTIAL ELEMENTS

In addition to walking audits (to identify engineering issues and solutions) and police stings (to enforce pedestrian right-of-way laws), essential elements of a good Safe Routes to Schools Program include walking pools or walking school buses, crossing guard programs, and walking route maps. The following sections provide recommendations for the development and implementation of these elements.

Walking pools, walking school buses, crossing guard programs

A walking school bus program involves parents taking turns walking with groups of children to and from school. In a walking pool, parents walk students to a central location to be walked to school with one or more parents. Children often play games and sing songs to make the walk fun. The programs ensure the safety of children and provide additional eyes on the street to make neighborhoods safer. Crossing guards should be provided near schools at the beginning and end of the school day. They should be trained regarding school area traffic safety and should be familiar with safe walking routes around individual school sites. While not all school districts provide funding for crossing guards, parents or other volunteers may fill these positions on a voluntary basis.

The State of California provides the following criteria for the placement of school crossing guards in the MUTCD 2003 California Supplement:

“Adult school crossing guards normally are assigned where at least 40 school pedestrians over the course of two hours each day cross a public highway on the way to or from school. Guards also should be considered when special situations make it necessary to assist elementary school pedestrians in crossing the street.

“In some cases, [when] a change in the school crossing location is underway, prevailing conditions require

crossing supervision until the change is completed, so a guard should be considered.”⁸

The guidance provides additional criteria for specific situations, including uncontrolled crossings, stop sign-controlled crossings and traffic signal-controlled crossings. These criteria are based on vehicular traffic volume, vehicle speed and the number of vehicular turning movements.

Walking route maps

Suggested route to school maps are one of the most cost-effective and tangible means available for encouraging school children to walk or bike to school. The purpose of the maps is to provide school officials, parents, and students with a tool to help plan the best walking and bicycling routes to and from school. The maps help to illustrate the safest walking, bicycling, and crossing locations by identifying traffic controls, crossing guard locations, and the presence of sidewalks, pathways, or bicycle facilities along routes leading to a given school. In addition to being used as a resource for parents and school staff in planning and encouraging walking and bicycling to school, Suggested route to school maps can serve as a tool for city staff to identify the location of needed transportation infrastructure improvements in school areas.

Local jurisdictions should consider assisting their school districts in developing and distributing suggested route to school maps to local schools. Maps can be handed out to parents at the beginning of each school year, posted prominently at each school in a location, and made available on the school's website. Other locations for posting or distributing the maps might include local libraries and neighborhood community centers.

As part of the development of Suggested Routes maps, city staff should conduct field visits to inventory traffic controls, signage, crosswalks, and other physical conditions on streets surrounding the school. Factors that contribute to designating the “best” routes to a school include the presence of traffic controls, crosswalks, and/or crossing guards at key crossing locations, and presence of sidewalks or bike lanes along street segments. In some cases, roadside paths or known off-street cut-throughs (such as a path leading to the back of a school)

⁸ California Manual on Uniform Traffic Control Devices, Part 7, Traffic Controls for School Areas.

are noted as suggested routes. The suggested routes usually extend about one-half mile for elementary schools, and about one mile for junior high and high schools.

Liability concerns are sometimes cited by cities or school districts as reasons not to publish walking route maps. While no walking route will ever be completely free of pedestrian safety concerns, a well-defined walking route should provide the greatest physical separation between walking children and traffic, expose children to the lowest traffic speeds, and have the fewest roadway crossings. Local jurisdictions should follow these basic guidelines when identifying routes, should regularly review walking routes to ensure that traffic conditions have not changed, and should make engineering improvements as appropriate to improve safety along routes. These steps should ensure that local jurisdictions or schools do not have increased liability as a result of publishing walking routes.

The State of Washington requires by law that school districts develop walking route plans for every elementary school where children walk to school. These plans must cover a one-mile radius from the school and be distributed to all elementary school students and parents. The Traffic Safety Commission and Department of Transportation of the State of Washington have jointly published a guidebook to help local school districts comply with the walking route plan requirement. It contains extensive guidance on how to establish appropriate walking routes and addresses liability concerns some jurisdictions may have.

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- ▶ Washington State School Administrator's Guide to School Walk Routes and Student Pedestrian Safety www.k12.wa.us/transportation/pubdocs/WalkRoutes.pdf
 - ▶ Sample walking route maps from the City of Santa Clarita, California www.santa-clarita.com/community/schools/routes.asp
-

Starting and running a successful program

A good opportunity to kick-off a SR2S program is during International Walk to School Day, held annually in early October. Organized Bike and Walk to School Days should be held monthly or weekly to keep the momentum going and encourage more children and their parents to walk or bike to school. Events related to

bicycling and walking should be incorporated into existing curricula when practical. Involving local celebrities or publishing the names of student participants in events can be an effective means of encouraging student involvement. Another key to successful events is promotion. Ensuring that parents are aware of events, whether classroom-specific or district-wide, is key to gaining maximum student participation.

Prizes or drawings for prizes have been used in some schools as an incentive to walk to school. Other contests and event ideas to encourage bicycling and walking to school include: competitions in which classrooms compete for the highest proportion of students walking or biking to school, themed or seasonal events, and keeping classroom logs of the number of miles biked and walked by children and plotting these distances on a map of California or the US.

LOCAL WALKING PROMOTIONS

Walking promotions are intended to educate and motivate people to walk for transportation and physical activity. Examples of walking promotions that are already available in, or may be appropriate for implementation in, Alameda County jurisdictions are listed below.

Monthly walking day

The City of Berkeley sponsored an "Everybody Walks in Berkeley!" promotion, which encouraged residents to walk on the first Wednesday of every month to enhance public health and reduce chronic disease.

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- ▶ Everybody Walks in Berkeley website www.ci.berkeley.ca.us/ContentDisplay.aspx?id=18442
-

Walk to transit promotion

Since most public transit trips begin and end with walking, increased use of public transit could provide more opportunities for people to be physically active, says a study by the Centers for Disease Control and Prevention. Americans who use buses, subways and other public transit spend a median of 19 minutes a day walking to and from transit.

Transit ambassador or travel training programs

These programs offer personalized orientation for new users of public transit in a particular geographic area.

Education and Encouragement Programs

Trained volunteers assist new riders in learning how to read schedules, plan a trip, where to catch the bus, how to use transfers, how to pay the fare, how passes work, and about special features such as the wheelchair lift and “kneeling” buses. ACTIA has developed travel training resources and has funded related programs in Alameda County.

- ▶ ACTIA travel training resources
www.acta2002.com/provider-toolkit-5.html
- ▶ Napa County Transit Ambassador Program
www.nctpa.net/ambassadors.cfm
- ▶ United Seniors of Oakland and Alameda County Travel Training Report
www.usoac.org/tt_report.pdf
- ▶ Fremont/Union City/Newark Tri-City Travel Training Program
www.tceconline.org/programs_travel.html

Organized walks

Many organizations throughout Alameda County lead weekly or annual walks as a way to encourage physical activity, introduce residents to each other and to their communities, and promote walking for transportation.



The Walkable Neighborhoods for Seniors walk clubs, organized by United Seniors of Oakland and Alameda County and jointly funded by the Robert Wood Johnson Foundation, leads weekly walks in locations throughout the County.

Alameda Walks! is a program sponsored by the Alameda Collaborative for Children, Youth and Their Families, the Alameda Recreation and Park Department, and

Pedestrian Friendly Alameda. Civic leaders lead weekly one-hour walks from May through December.

The City of Fremont began a senior walk club program in July 2009, which will create 12 ongoing walking clubs in Fremont, Newark and Union City. Each club will include a 20-week educational curriculum to teach walking safety, health and personal security tips.

- ▶ Walkable Neighborhoods for Seniors
www.ebdir.net/wn4s/schedule.html
- ▶ Alameda Walks!
www.ci.alameda.ca.us/community/alameda_walks.html

PEDESTRIAN MAPS

Pedestrian maps show walking routes through neighborhoods, historic districts, parks, greenways and along bodies of water. Such maps can identify routes that start and end at the same place, or suggest good ways to reach popular destinations on foot. Some walking maps indicate walking times in addition to distances.

Walk Oakland! map and guide

The Walk Oakland! Map and Guide highlights the City's historic walkways, neighborhoods, and landmarks to raise awareness and encourage walking in Oakland. It includes bikeways, street grades, parks, schools, libraries, and post offices as well as information on pedestrian and bicyclist safety, city resources, and area transit.

- ▶ Walk Oakland! Map
To order maps, contact the Oakland Museum at 510.238.6305

Berkeley Pathways Map

The Berkeley Pathways Map provides a map of historic walking paths throughout Berkeley (most are concentrated in the City's hilly eastern areas).

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- ▶ Berkeley Path Wanderers Association Pathways Map
www.berkeleypaths.org/paths/paths.htm
-

Walnut Creek Art Walk

The Walnut Creek Art Walk and Tours map leads pedestrians on a walking tour of public art throughout Walnut Creek. Public art encourages walking by adding interest to the pedestrian realm and walking experience.

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- ▶ Walnut Creek Art Walk and Tours
www.bedfordgallery.org/public_art.htm
-

ENFORCEMENT

Enforcement of pedestrian right-of-way and traffic laws is an important strategy to complement engineering, education, and encouragement efforts. Best practices in pedestrian safety enforcement include:

- Conducting pedestrian “sting” operations (enhanced by involving the media and distributing educational materials)
- Collaborating with other cities to share police resources.
- Training officers in pedestrian safety enforcement principles. The Madison, WI Department of Transportation has developed a DVD in collaboration with the Madison Police Department to train traffic officers in pedestrian and bicycle issues. The Bicycle Transportation Alliance in Portland, OR offers pedestrian safety enforcement training.
- Establishing a radar gun check-out program for trained community volunteers to record speeding vehicles’ license plate numbers. These programs are available in Albany, Pleasanton, and Thousand Oaks, CA, among other cities.

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- ▶ Miami/Dade Pedestrian Education and Enforcement Study
www.walkinginfo.org/library/details.cfm?id=4295
 - ▶ Madison, WI Police Training DVD
www.walkinginfo.org/library/details.cfm?id=2865
 - ▶ Portland Bicycle Transportation Alliance Pedestrian Safety Training
www.bta4bikes.org/at_work/pedestriangrants.php
 - ▶ Pleasanton radar gun check-out program
www.ci.pleasanton.ca.us/services/police/traffic/team-program.html
-

PUBLIC INVOLVEMENT

Local governments use a number of mechanisms to engage local residents in the planning and problem-solving processes. These include convening pedestrian advisory committees, interacting with advocacy groups and soliciting input from the general public.

Pedestrian advisory committees

A Pedestrian Advisory Committee (PAC) can help a jurisdiction address pedestrian issues, while lending legitimacy to pedestrian planning efforts. Considerations when forming a PAC include size, membership, needed staff commitment, and meeting location. The Pedestrian and Bicycle Information Center publishes a report that provides recommendations for the formation of PACs (termed Pedestrian Advisory Boards in the PBIC document). The report addresses how to select qualified committee members, the logistical support needed to run a committee, how to keep members informed, and how to set an effective agenda. A link to this document is provided below.

Educating PAC members and residents in general can also encourage public involvement in pedestrian planning. The FHWA’s *Resident’s Guide for Creating Safe and Walkable Communities* and their advisory committee training courses are two such resources.

Education and Encouragement Programs

- ▶ How to Create and Run an Effective Pedestrian Advisory Board
www.walkinginfo.org/pp/howtoguide2006.pdf (see Appendix A)
- ▶ A Resident's Guide for Creating Safe and Walkable Communities
http://safety.fhwa.dot.gov/ped_bike/ped_cmnty/ped_walkguide/index.cfm#toc

The Metropolitan Transportation Commission's TDA Article 3 Bicycle and Pedestrian Funding Program requires that local Bicycle Advisory Committees review projects to be eligible for funding. There is no similar requirement for Pedestrian Advisory Committees; however, Bicycle Advisory Committees sometimes include pedestrian representatives to form Bicycle and Pedestrian Advisory Committees (BPACs). For jurisdictions that choose to create BPACs, it is important to ensure that pedestrian interests are well represented, as bicycle advocacy has a longer history and often more vocal and organized members.



Pedestrian Advisory Committees may be established by ordinance, or as an informal body to advise staff. In order to establish an effective PAC, a jurisdiction must adopt by-laws or a charter for their committee, which governs the committee's role and scope of activity. The charter or by-laws may outline whether the committee advises staff, a standing board or commission or the City Council. If the PAC reports directly to a decision-making body, more staff time and oversight will be required. A more informal PAC requires less time commitment, yet may not have the influence of a committee reporting directly to council. Some PACs, such as the City of Berkeley's, report to another advisory body (the

Transportation Commission), which in turn reports to the City Council.

A separate pedestrian subcommittee or committee is a best practice; however, separate bicycle and pedestrian advisory committees requires additional staff time and resources. One option for balancing the benefits of citizen input and support for pedestrian projects and funding obtained through a PAC or BPAC, with the extra staff time required, is to establish a pedestrian group with fewer members and/or one that meets less frequently. Although some jurisdictions may have difficulty finding pedestrian representatives to fill a PAC, there are citizens in most cities who are interested in school safety or traffic calming, which both address pedestrian issues. Although these residents may not self-identify as pedestrian advocates, they can often represent pedestrian interests well.

Sample guidelines and by-laws can be found at the following links (these links provide samples for BPACs only). A list of the local bicycle and/or pedestrian advocacy committees in Alameda county can be found at the link below.

- ▶ ACTIA's Bicycle and Pedestrian Advisory Committee Guidelines
www.acta2002.com/pdfs/BPAC-guidelines.pdf
- ▶ List of Alameda County Bicycle and/or Pedestrian Advisory Committees
www.actia2022.com/bikeped.html
- ▶ Valley Transportation Authority's BPAC By-laws
www.vta.org/inside/boards/committee_advisory/bpac/bylaws/bpac_bylaws.doc

Engaging the advocacy community

Cities such as Santa Barbara and Chicago actively engage their pedestrian advocacy communities through partnerships for grant writing, education, and outreach. The Coalition for Sustainable Transportation (COAST) in Santa Barbara holds public workshops and manages the city's Safe Routes to Schools program. The Active Transportation Alliance in Chicago offers consulting services including master planning, GIS network analysis and mapping, education, and safety programs.

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- ▶ Chicago Active Transportation Alliance
www.activetrans.org

- ▶ COAST
<http://coast-santabarbara.org>
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The Albany Strollers and Rollers advocacy group formed in 2004 to address connections to the Bay Trail under several freeway ramps. Since then, to promote walking and bicycling and showcase their efforts, they have been active in pedestrian and bicycle advocacy events more broadly including:

- A booth at the "Community Event to Fight Global Warming" every June in Albany
- A booth at the Albany Spring Art and Music Festival
- A table at the UC Village Health and Wellness Fair
- A table at the Solano Stroll

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- ▶ Albany Strollers and Rollers
<http://sites.google.com/site/albanystrollersandrollers/>
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Across the Bay in San Francisco, the Sunday Streets program is a new effort to promote walking and bicycling by closing streets in neighborhoods throughout the City and providing a wide variety of activities, including dancing, biking, skating, walking, hula hooping, yoga, and just people-watching. The first Sunday Streets was held in 2008. The program continued in 2009 on six Sundays. Sunday Streets is based on the Ciclovía program in Bogota, Colombia, a weekly event with over 70 miles of city streets closed to traffic.

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- ▶ San Francisco Sunday Streets program
<http://sundaystreetsf.com>
 - ▶ International Ciclovía
www.streetfilms.org/archives/ciclovía/
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Public feedback process

Residents are often the first to identify unsafe local conditions, so providing an effective and transparent reporting system is essential. A best practice is a web-based tracking system for pedestrian complaints, allowing residents to track the progress and status of their complaint. Providing a city hotline number for

public feedback is also a streamlined approach to encourage resident input.

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- ▶ Berkeley City Center office
Tel: 510.981.CITY
 - ▶ Thousand Oaks Public Feedback Tracking System
<http://clients.comcate.com/newrequest.php?id=64>
 - ▶ Fresno City Hotline (621-CITY)
www.fresno.gov/Residents/OneCallCenter/Default.htm
-

5. Funding

CHAPTER GUIDE

TOPIC: Information on available funding for pedestrian planning, capital improvements, and programs.

AUDIENCE: Public agency staff, community-based organizations, pedestrian advocates and policy makers.

INTRODUCTION

Funding that can be used for pedestrian projects, programs and plans originates from all levels of government. By the time grant applicants see these funds, however, they have frequently been transformed and/or combined to form the funding sources with which project sponsors are familiar. This chapter covers federal, state, regional, and local sources of pedestrian funding, as well as some non-traditional funding sources that have been used by local agencies to improve walkability. A matrix with grant program websites, deadlines and much more is included at the end of the chapter.

More information regarding potential pedestrian funding sources is provided in the companion *Alameda Countywide Strategic Pedestrian Plan*.

FEDERAL FUNDING SOURCES

The primary federal source of surface transportation funding—including pedestrian facilities—is SAFETEA-LU, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. SAFETEA-LU is the fourth iteration of the transportation vision established by Congress in 1991 with the Intermodal Surface Transportation Efficiency Act (ISTEA) and renewed in 1998 and 2003 through the

Transportation Equity Act for the 21st Century (TEA-21) and the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA). Also known as the federal transportation bill, the \$286.5 billion SAFETEA-LU bill was passed in 2005 and authorizes Federal surface transportation programs for the five-year period between 2005 and 2009. At the time of printing, Congress was working on reauthorization legislation for the next funding bill, Moving Ahead for Progress in the 21st Century, or MAP-21.

SAFETEA-LU funding is administered through the State (Caltrans and Resources Agency) and regional planning agencies. Most, but not all, of these funding programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Specific funding programs under SAFETEA-LU include:

Congestion Mitigation and Air Quality (CMAQ) – Funds projects that are likely to contribute to the attainment of national ambient air quality standards. Funds are available for projects and programs in areas that have been designated in non-attainment or maintenance for ozone, carbon monoxide or particulate matter. This program provides \$1.8 billion nationally (\$365 million in California) for FY 2009, with funding available for obligation through 2012.

Recreational Trails Program – This program provides \$85 million nationally for FY 2009, with funding available for obligation through 2012 for non-motorized trail projects.

Safe Routes to School Program – A new program, administered by Caltrans, with \$183 million per year nationally (\$46 million in California) for FY 2009.

Transportation, Community and System Preservation Program – SAFETEA-LU authorized \$270 million nationally over five years (2005-2009) to be reserved for transit-oriented development, traffic calming and other projects that improve the efficiency of the transportation

Funding

system, reduce the impact on the environment, and provide efficient access to jobs, services and trade centers.

Federal Lands Highway Funds – Federal Lands Highway funds, for Indian Reservation Roads (IRR), Park Roads and Parkways, Public Lands Highways (discretionary and Forest Highways), and Refuge Roads Programs, may be used to build bicycle and pedestrian facilities in conjunction with roads and parkways at the discretion of the department charged with administration of the funds. The projects must be transportation-related and tied to a plan adopted by the State and MPO. Approximately \$4.5 billion dollars were available nationally for Federal Lands Highway Projects in FY 2005 through FY 2009.

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- ▶ SAFETEA-LU
www.fhwa.dot.gov/safetealu/index.htm
-

Additional federal funding became available in 2009 with the American Recovery and Reinvestment Act (ARRA – Stimulus funding). The primary stimulus funding source for pedestrian projects is the Energy Efficiency and Conservation Block Grant Program.

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- ▶ Energy Efficiency and Conservation Block Grant Program
www.eecbg.energy.gov/grantalloc.html
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STATEWIDE FUNDING SOURCES

The State of California uses both federal sources (such as the Recreational Trails Program) and its own budget to fund pedestrian projects and programs. In some cases, such as Safe Routes to School, Office of Traffic Safety, and Environmental Justice grants, project sponsors apply directly to the State for funding. In others, such as Bay Trail grants, sponsors apply to a regional agency.

Recreational Trails Program (RTP)

In California, RTP funds are administered by the California State Parks Department. Recreational Trails Program funds may be used for:

- Maintenance and restoration of existing trails;
- Purchase and lease of trail construction and maintenance equipment;
- Construction of new trails;
- Acquisition of easements or property for trails; and

- Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a State's funds).

\$4.7 million statewide was available in fiscal year 2009.

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- ▶ Federal Highway Administration, RTP Program
www.fhwa.dot.gov/environment/rectrails/index.htm
 - ▶ California State Parks, RTP Guide
www.parks.ca.gov/pages/1008/files/rtpguide.pdf
-

Land and Water Conservation Fund

The Land and Water Conservation Fund is a federal program that provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. The Fund is administered by the California State Parks Department and has been reauthorized until 2015.

Cities, counties and districts authorized to acquire, develop, operate and maintain park and recreation facilities are eligible to apply. Applicants must fund the entire project, and will be reimbursed for 50 percent of costs. Property acquired or developed under the program must be retained in perpetuity for public recreational use. The grant process for local agencies is competitive, and forty percent of grants are reserved for Northern California.

In 2008-09, approximately \$440,000 was available for projects in Northern California.

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- ▶ California State Parks Department, Land and Water Conservation Fund Guide
www.parks.ca.gov/?page_id=21360
-



Safe Routes to School (SR2S)

In September 2004, with the passage of SB 1087 (Soto), the State extended Safe Routes to School legislation for three additional years. In 2007, Assembly Bill 57 extended the program indefinitely.

It is meant to improve the safety of walking and cycling to school and encourage students to walk and bicycle to school through identification of existing and new routes

to school and construction of pedestrian and bicycle safety and traffic calming projects.

Cycle 8 (FY 08/09 and 09/10) included \$48.5 million in funding. State SR2S funds require a 10 percent local match (federal funds require no match). Projects must be completed within four state fiscal years after project funds are allocated.

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- ▶ Caltrans, SR2S Program
www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm
-

Environmental Justice: Context Sensitive Planning Grants

The Caltrans-administered Environmental Justice: Context Sensitive Planning Grants Program funds planning activities that assist low-income, minority, and Native American communities in becoming active participants in transportation planning and project development. Grants are available to transit districts, cities, counties, and tribal governments. For FY 2008-2009, approximately \$3 million was allocated through this grant program. The grant requires a local match of 10 percent with a five percent in-kind contribution maximum.

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- ▶ Caltrans, Environmental Justice Program
www.dot.ca.gov/hq/tpp/grants.html
-

Office of Traffic Safety (OTS) Grants

The California Office of Traffic Safety distributes federal funding apportioned to California under the National Highway Safety Act and SAFETEA-LU. Grants are used to establish new traffic safety programs and to expand ongoing programs to address deficiencies in current programs. Bicycle and pedestrian safety are included in the list of traffic safety priority areas. Eligible grantees are: governmental agencies, state colleges and state universities, local city and county government agencies, school districts, fire departments, and public emergency services providers. Grant funding cannot replace existing program expenditures, nor can traffic safety funds be used for program maintenance, research, rehabilitation, or construction. Grants are awarded on a competitive basis, and priority is given to agencies with the greatest need. Evaluation criteria to assess need include: potential traffic safety impact, collision statistics and rankings, seriousness of problems, and performance on previous

OTS grants. OTS awarded \$66 million statewide in FY 2008/09.

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- ▶ California Office of Traffic Safety, Grants Program
www.ots.ca.gov/grants/default.asp
-

California Center for Physical Activity Grant Program

The California Center for Physical Activity runs several programs related to walking and offers small grants to public health departments. Grants are in the amount of \$4,999 dollars or less and are offered intermittently.

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- ▶ California Center for Physical Activity
www.caphysicalactivity.org/our_projects.html
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Coastal Conservancy Non-Profit Grants Program

The Coastal Conservancy provides grants to non-profit organizations for projects that provide access to the California coast and preserve coastal lands, including trail construction. Funds are available from \$10,000 to several million dollars, depending on need and funds available.

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- ▶ California Coastal Conservancy Grant Programs
www.coastalconservancy.ca.gov/Programs/guide.htm
-

REGIONAL FUNDING SOURCES

Funding for regional pedestrian grant programs comes from a variety of sources, including SAFETEA-LU, the State budget, vehicle registration fees and bridge tolls. Although most regional funds are allocated by regional agencies such as the Metropolitan Transportation Commission (MTC), the Bay Area Air Quality Management District (BAAQMD) and the Association of Bay Area Governments (ABAG), some flow to county congestion management agencies, such as the Alameda County Congestion Management Agency (ACCM), which allocate funds to project sponsors.

TRANSPORTATION CLIMATE ACTION CAMPAIGN

In 2009, MTC adopted *Transportation 2035: Change in Motion*, the San Francisco Bay Area's 25-year vision for the region's regional transportation system. In a ringing endorsement of "active transportation" (see *Walking and Public Health* section of Chapter 2), the plan calls for the

Funding

creation of a new \$400 million Transportation Climate Action Campaign, in cooperation with the Bay Area Air Quality Management District, the Bay Conservation and Development Commission and the Association of Bay Area Governments. The Campaign contains the following funding programs.

Safe Routes to Transit (SR2T)

Regional Measure 2 (RM2), approved in March 2004, raised the toll on seven state-owned Bay Area bridges by one dollar for 20 years. This fee increase funds various operational improvements and capital projects that reduce congestion or improve travel in the toll bridge corridors.

Twenty million dollars of RM2 funding is allocated to the Safe Routes to Transit Program, which provides competitive grant funding for capital and planning projects that improve bicycle and pedestrian access to transit facilities. Eligible projects must be shown to reduce congestion on one or more of the Bay Area's toll bridges by improving access to regionally serving transit or the transit lines that serve them. The competitive grant process is administered by TransForm and the East Bay Bicycle Coalition. Competitive funding is awarded in five \$4 million grant cycles: the first two in 2005 and 2007; and the final three in 2009, 2011 and 2013.

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- ▶ TransForm, SR2T Program
<http://transformca.org/campaign/sr2t>
-

Regional Safe Routes to Schools Program

The Transportation Climate Action Campaign includes a new regional Safe Routes to Schools program to augment existing programs in Alameda County and throughout the Bay Area.

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- ▶ MTC's Transportation 2035 Plan: Change in Motion
www.mtc.ca.gov/planning/2035_plan
-

OTHER MTC FUNDING PROGRAMS

Regional Bicycle Program (RBP)

In 2003, the Regional Bicycle and Pedestrian Program was created as part of MTC's Transportation 2030 Plan. The program—funded with Congestion Mitigation and Air Quality funds—funded regionally significant pedestrian and bicycle projects, and bicycle and

pedestrian projects serving schools or transit. The *Transportation 2035 Plan* changed this program to focus on the *Regional Bicycle Plan*, and significantly increased funding to the program, committing \$1 billion in discretionary funds to complete the Regional Bikeway Network. Although now a bicycle program, it will fund multi-use paths, which are available to pedestrians.

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- ▶ MTC's Transportation 2035 Plan: Change in Motion
www.mtc.ca.gov/planning/2035_plan
-

Transportation for Livable Communities (TLC)

TLC provides planning and capital funds for projects designed to improve pedestrian, bicycle and transit access in existing town centers and near public transit. TLC's focus is small-scale transportation improvements that are designed to make a big difference in a community's vitality. Eligible projects include streetscape improvements, and transit-, pedestrian-, and bicycle-oriented developments. *Transportation 2035 Plan* doubled funding for the TLC program to a total of \$2.2 billion through 2035.

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- ▶ Metropolitan Transportation Commission, TLC Grant Program
www.mtc.ca.gov/planning/smart_growth/tlc_grants.htm
-

OTHER REGIONAL FUNDING PROGRAMS

Transportation Fund for Clean Air Program (TFCA)



TRANSPORTATION
FUND FOR
CLEAN AIR

TFCA funds are generated by a four dollar surcharge on automobile registration fees in the nine-county Bay Area. Approximately \$20 million is collected annually which funds two programs: 60 percent of the TFCA monies go to the Regional Fund and 40 percent go to the County Program Manager Fund. In Alameda County, 70 percent of the Program Manager Funds are distributed to cities based on population. The remaining 30 percent are competitive funds available to transit agencies.

The Regional Fund is administered by the Bay Area Air Quality Management District (BAAQMD). In Alameda County, the Program Manager Fund is administered by

the ACCMA. Pedestrian infrastructure improvements are eligible for TFCA funds through the Smart Growth funding category.

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- ▶ BAAQMD, TFCA Program
www.baaqmd.gov/pln/grants_and_incentives/tfca
-

The Bay Trail Project

The Bay Trail Grant program offers competitive grants to local governments, special districts and qualified nonprofit groups to build or design new Bay Trail segments. The program is structured to: speed Bay Trail construction by targeting high-priority, ready to build sections and closing critical gaps; leverage state dollars with significant matching funds and in-kind contributions; foster partnership by encouraging cooperative partnerships and creative design solutions; and employ the California Conservation Corps for construction, landscaping and maintenance where possible. The amount of available funding varies, depending on State bonds and grants to the Bay Trail Project.

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- ▶ Bay Trail Project Grant Program
<http://baytrail.abag.ca.gov/grantsbycounty.htm#al>
-

RELATED REGIONAL LAND USE POLICY

Recent widespread recognition of the relationship between land use and transportation planning has resulted in at least two Bay Area region-wide policies linking funding requirements to land use.

MTC Resolution 3434 places conditions on funding for transit expansion projects to improve the cost-effectiveness of regional transportation investments, ease the Bay Area's chronic housing shortage, create vibrant new communities, and help preserve regional open space. Conditions include density thresholds, requirements for specific area plans, and the establishment of transit corridor working groups.

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- ▶ MTC Resolution 3434 program
www.mtc.ca.gov/planning/smart_growth/tod/TOD_policy.pdf
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BART's expansion policy takes into account existing land uses and the potential for future ridership. BART's expansion project evaluation criteria include existing land use, plans and policies, and intermodal connections.

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- ▶ BART's expansion policy
www.bart.gov/docs/planning/system_expansion.pdf
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LOCAL FUNDING SOURCES

TDA Article 3

Transportation Development Act (TDA) Article 3 funds are available for transit, bicycle and pedestrian projects in California. According to the Act, pedestrian and bicycle projects are allocated two percent of the revenue from a ¼ cent of the general state sales tax, which is dedicated to local transportation. These funds are collected by the State, returned to each county based on sales tax revenues, and typically apportioned to areas within the county based on population.

Eligible pedestrian and bicycle projects include: construction and engineering for capital projects; maintenance of bikeways; bicycle safety education programs; and development of comprehensive bicycle or pedestrian facilities plans. A city or county is allowed to apply for funding for bicycle or pedestrian plans not more than once every five years. These funds may be used to meet local match requirements for federal funding sources. \$1 million in TDA Article 3 funds were allocated in Alameda County in 2009/10.

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- ▶ Metropolitan Transportation Commission, TDA Funding Program
www.mtc.ca.gov/funding/STA-TDA/index.htm
-

ACTIA Bicycle and Pedestrian Measure B Funding

Measure B is a sales tax measure reauthorized by Alameda County voters in 2000. It allows the collection of a ½ cent sales tax devoted to transportation projects and programs, to be collected from 2002 through 2022. The portion of Measure B funding devoted to bicycle and pedestrian improvements totals approximately \$100 million, or five percent of all Measure B funding. Of this amount, 75 percent is distributed to the cities and the County according to population and may be used for locally prioritized bicycle or pedestrian projects, programs and plans. The remaining 25 percent is

Funding

available for capital projects, programs and plans of countywide significance. Most of the countywide funds are distributed based on a competitive grant process. As of the most recent grant cycle in 2009, \$9.5 million in grants have been awarded. The grant program is semi-annual.

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- ▶ ACTIA Measure B Program
www.acta2002.com/bikeped.html
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NON-TRADITIONAL SOURCES

Integration into larger projects

California State's complete streets policies require Caltrans to design, construct, operate, and maintain transportation facilities using best practices for pedestrians and bicyclists. Local jurisdictions can begin to expect that some portion of pedestrian project costs, when they are built as part of larger transportation projects, will be covered in project construction budgets. This applies to Caltrans and other transportation facilities, such as new BART stations and Bus Rapid Transit stops.

Community Development Block Grants

The CDBG program provides money for streetscape revitalization, which may be largely comprised of pedestrian improvements. Federal Community Development Block Grant Grantees may use CDBG funds for activities that include (but are not limited to): acquiring real property; building public facilities and improvements, such as streets, sidewalks, and recreational facilities; and planning and administrative expenses, such as costs related to developing a consolidated Plan and managing CDBG funds. In Oakland, CDBG funds have also been used to fund crossing guards, called "Safe Walk to School Monitors." Four hundred sixty-one million dollars in CDBG funds were distributed statewide in FY 2009.

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- ▶ CDBG program
www.hud.gov/offices/cpd/communitydevelopment/programs/index.cfm
-

Private sources/foundations

With connections to climate change and public health, pedestrian projects may be eligible for funding under a variety of private grant/foundation sources. The Robert

Wood Johnson Active Living by Design program works with funding organizations such as Blue Cross/ Blue Shield, the Kellogg Foundation, Kaiser Permanente, and the Robert Wood Johnson Foundation to fund active living projects and programs.

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- ▶ Robert Wood Johnson Active Living by Design
www.activelivingbydesign.org
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REQUIREMENTS FOR NEW DEVELOPMENT

New construction

With the increasing support for "complete streets," requirements for new development, road widening, and new commercial development provide opportunities to efficiently construct pedestrian facilities.

Impact fees

One potential local source of funding is developer impact fees, typically tied to trip generation rates and traffic impacts produced by a proposed project. A developer may attempt to reduce the number of trips (and hence impacts and cost) by paying for on- and off-site pedestrian improvements designed to encourage residents, employees and visitors to the new development to walk rather than drive. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical for avoiding a potential lawsuit.

As of 2009, the City of Berkeley is considering adoption of a Transportation Services Fee which would require payment of a fee to mitigate the traffic impacts of new development.

Mello-Roos Community Facilities Act

The Mello-Roos Community Facilities Act was passed by the Legislature in 1982 in response to reduced funding opportunities brought about by the passage of Proposition 13. The Mello-Roos Act allows any county, city, special district, school district, or joint powers of authority to establish a Community Facility Districts (CFD) for the purpose of selling tax-exempt bonds to fund public improvements within that district. CFDs must be approved by a two-thirds margin of qualified voters in the district. Property owners within the district are responsible for paying back the bonds. Pedestrian facilities are eligible for funding under CFD bonds.

- ▶ Mello-Roos Fact Sheet
<http://mello-roos.com/pdf/mrpdf.pdf>

FUNDING A PEDESTRIAN PLAN

A pedestrian plan can be developed in house by agency staff or by a private consultant who specializes in

pedestrian planning. The decision depends on the size and complexity of the jurisdiction, staff availability and expertise, and the amount of funding available. In Alameda County, three of the sources that fund pedestrian improvements also fund pedestrian plans (see table below).

Pedestrian Plan Funding Sources in Alameda County

Funding Source	Administrating Agency	Contact
Non-Competitive Sources		
TDA Article 3 Funding	Alameda County Public Works Agency	info@acpwa.org
Alameda County Measure B Local Pass-Through Funds	Alameda County Transportation Improvement Authority	www.actia2022.com
Competitive Sources		
Alameda County Measure B Countywide Discretionary Fund Grant Program	Alameda County Transportation Improvement Authority	www.actia2022.com

TIPS FOR A SUCCESSFUL GRANT APPLICATION⁹

GETTING ORGANIZED

- Determine if your project is eligible.
- Determine what is required for submitting an application.
- Give yourself a reasonable amount of time to prepare the application.
- Carefully read and re-read the solicitation notice and follow the directions exactly.
- Collect sample successful grants to use as models.
- Get to know the individuals who work for the agencies to which you're applying.
- Ensure environmental documentation requirements are met.
- Round up support for your project.

⁹ Solano Countywide Pedestrian Plan and US EPA Region 2.

PREPARING THE APPLICATION

- Describe how your project will achieve the goals of the grant program.
- Use the same terms in your proposal that the agencies used to describe what they want to fund.
- Write clearly and concisely.
- Make it easy for the reviewer to find ways to give you the credit you deserve.
- Have a colleague review the application.

PROJECT ESTIMATING AND GRANT BUDGETING

- Include all foreseeable costs.
- Review the proposal solicitation notice to determine what costs can be covered and what expenses are not eligible.
- Prepare a thorough, realistic cost estimate.

FINISHING AND SUBMITTING THE APPLICATION

- Check spelling and grammar repeatedly.
- Re-read the final copy of your proposal slowly and carefully.
- Submit a complete application package.

Funding

- Submit your application on time to the appropriate contact.

FOLLOW-UP

- Contact the funding source about the status, evaluation, and outcome of your proposal.
- Document the process you used to prepare the proposal.

More detail on each of these steps is available in the *Solano Countywide Pedestrian Plan*.

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- ▶ Solano Countywide Pedestrian Plan
www.sta.dst.ca.us/plans2.html#pedplan
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FUNDING SOURCE SUMMARIES

FUNDING BY PROJECT TYPE

A listing of project types and corresponding potential funding sources is available from the Pedestrian and Bicycle Information Center. The website lists different types of pedestrian and bicycle projects and identifies the federal funds that are most appropriate for each type of project.

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- ▶ Walkinfo.org Federal Funding Website
www.walkinginfo.org/funding/sources.cfm
-

MATRIX OF FUNDING SOURCES

The matrix starting on the next page provides detailed information for the funding sources listed in the preceding section. Beside each source is the corresponding application deadline, the allocating agency, the amount available, matching requirements, eligible applicants, eligible projects and comments, including agency website information.

Pedestrian Funding Sources

Key to acronyms follows table.

Grant Source / Agency	Application Deadline	Program Funds Available	Matching Requirement	Eligible Applicants	Commute, Recreation or Safety/ Education	Comments / Contact Information
Federal Funding						
Federal Lands Highway Funds / FHWA	Varies	\$4.5 billion dollars total nationwide FY 2005-09	None	State	C, R, SE	Project must appear in STIP. Contact California Division, FHWA www.fhwa.dot.gov/cadiv/directory.htm
Transportation, Community and System Preservation Program (TCSP) / FHWA	Varies	\$270 million nationwide FY 2005-09	20% local match	State, local, MPOs	--	Projects that improve system efficiency, reduce environmental impacts of transportation, etc. Contact www.fhwa.dot.gov/tcsp/pj_tcsp.htm
Energy Efficiency and Conservation Block Grant Program/ U.S. Department of Energy	June 25, 2009	\$1.9 billion for formula grants to eligible cities and counties; \$767 million formula grants to states; \$55 million formula grants to eligible Indian tribes	None	State, counties, local	C, R, SE	New funding available through the 2009 Federal Stimulus Funding Bill. Pedestrian projects must show energy efficiency/conservation link. www.eecbg.energy.gov/grantall oc.html
State Funding						
California Center for Physical Activity Grant Program / Department of Health Services	Ongoing	Up to \$4,999 per grantee	None	Public Health Departments	SE	For pedestrian encouragement programs www.caphysicalactivity.org
Coastal Conservancy Non-Profit Grants Program / Coastal Conservancy	Ongoing	Grants range from \$10,000 to several million	Not required but favored	California non-profit 501 (c) 3 organizations	R	Funds for trail planning and construction and restoration of coastal urban waterfronts. www.coastalconservancy.ca.gov/Programs/guide.htm

Funding

Grant Source / Agency	Application Deadline	Program Funds Available	Matching Requirement	Eligible Applicants	Commute, Recreation or Safety/ Education	Comments / Contact Information
Environmental Justice Grants: Context Sensitive Planning / Caltrans	October 14	\$3 million statewide	10% local	City, county, tribal governments, transit districts	C, R, SE	Funds activities that include low-income and minority communities in transportation planning and project development. www.dot.ca.gov/hq/tpp/grants.html
Land and Water Conservation Fund (LCWF) / California State Parks	March 2 (local agencies)	\$440,000 for Northern California (2008-09)	50% match	Cities, counties, park districts	R	Recreational trails are eligible for funding. Applicants must fund the entire project, and will be reimbursed for 50% of costs. www.parks.ca.gov/?page_id=21360
Office of Traffic Safety Grants / Office of Traffic Safety	Jan. 31	\$66 million statewide (FY 2008/09)	None	Governmental agencies, state colleges, and state universities, local city and county government agencies, school districts, fire departments, and public emergency services providers	SE	Grants are used to mitigate traffic safety program deficiencies, expand ongoing activity, or develop a new program. Grant funding cannot replace existing program expenditures, nor can traffic safety funds be used for program maintenance, research, rehabilitation, or construction. www.ots.ca.gov/Grants/default.asp
Recreational Trails Program (RTP) / California State Parks	Oct. 1	\$4.7 million statewide (FY 2008-09)	20% match	Jurisdictions, special districts, non profits with management responsibilities over the land	R	For recreational trails to benefit bicyclists, pedestrians, and other users. www.parks.ca.gov/?Page_id=24324
Safe Routes to School (AB 1475/SB1087) / Caltrans	April 15	\$48.5 million statewide (FY 2008-09 and 2009-10)	10%	City, county	C, R, SE	Primarily construction program to enhance safety of pedestrian and bicycle facilities. www.dot.ca.gov/hq/LocalPrograms/saferoutes/sr2s.htm
Regional Funding						
The San Francisco Bay Trail Project / Bay Trail Project, ABAG	Varies	Total available varies from year to year		Public Agencies, Land Trusts, Non-profits	C, R	Funds trail planning and construction projects to complete gaps in the Bay Trail. http://baytrail.abag.ca.gov/grants.html

Grant Source / Agency	Application Deadline	Program Funds Available	Matching Requirement	Eligible Applicants	Commute, Recreation or Safety/ Education	Comments / Contact Information
Regional Bicycle Program (RBP) / MTC	TBD	\$1 billion through 2035 for the Regional Bicycle Network.	TBD	TBD	C	Constructing projects in the Regional Bikeway Network, including multi-use pathways. www.mtc.ca.gov/planning/bicyclespedestrians/
Safe Routes to Schools (SR2S) / MTC	TBD	TBD	TBD	TBD	C, SE	This new program is approved as part of the regional transportation plan adopted in 2009. Program details, including funding amounts, are to be determined.
Safe Routes to Transit / MTC (administered by TransForm)	2009, 2011 and 2013	\$2 million annually region-wide	None required, but scoring preference given to projects with outside match	Public Agencies in all 9 Bay Area counties. Non-profits must partner with a public agency to apply.	C	Applications must demonstrate bridge congestion reduction on at least one state-owned Bay Area bridge. http://transformca.org/campaign/sr2t
Transportation Fund for Clean Air (TFCA), Program Manager Fund / ACCMA, BAAQMD	January in Alameda County, varies in other counties	Approx. \$8 million annually region-wide	None	Cities, counties, transit districts	C	Smart growth projects: Physical improvements that support development projects and/or calm traffic, resulting in the achievement of motor vehicle emission reductions. www.accma.ca.gov/pages/FundTFCA.aspx
Transportation Fund for Clean Air (TFCA) Program, Regional Fund / BAAQMD	Varies	Approx. \$10 million annually region-wide	10% for requests greater than \$150,000	Cities, county, school districts, transit districts	C	Smart growth projects: Physical improvements that support development projects and/or calm traffic, resulting in motor vehicle emission reductions. www.baaqmd.gov/pln/grants_and_incentives/tfca/regional_fund.htm
Transportation for Livable Communities (TLC) Program / MTC	June	\$2.2 billion region-wide through 2035	Local match of 11.5% is required	Public Agencies. Non-profits and other CBOs may partner with public agency to apply.	C, SE	Funds for transportation projects that revitalize downtown areas, commercial cores, transit corridors and neighborhoods www.mtc.ca.gov/planning/smart_growth/tlc_grants.htm

Funding

Grant Source / Agency	Application Deadline	Program Funds Available	Matching Requirement	Eligible Applicants	Commute, Recreation or Safety/ Education	Comments / Contact Information
Local Funding						
ACTIA Bicycle and Pedestrian Measure B Funding / ACTIA	Varies	\$100 million countywide through 2022	No match is required; however projects with a match will score better.	Any public agency that operates in Alameda County.	C, R, SE	All grant projects must demonstrate countywide significance. (Local pass-through funds provided monthly to every city and the County.) www.actia2022.com/bikeped.html
Transportation Development Act (TDA) Article 3 / MTC, Alameda County PWA	January	\$1.1 million in Alameda County (2009-10)	--	Alameda County	C, SE	www.mtc.ca.gov/funding/STA-TDA/ info@acpwa.org
Nontraditional sources						
Community Development Block Grants / HUD	Varies	\$461 million statewide (FY 2009)	None, but may be used as evaluation criteria	Public entities and 501(c)(3) non-profits and tax-exempt faith-based religious organizations		Primarily for community revitalization, but may be used to fund streetscape improvements, to eliminate blight in low- and moderate-income areas. www.hud.gov/local/ca/community/cdbg/index.cfm
Mello-Roos Community Facilities Act / Various public agencies	None	Varies	None		C, R, SE	Primarily used to fund public services such as libraries and fire depts., but may fund pedestrian infrastructure. http://cfd.co.riverside.ca.us/Land%20Secured%20Policies%20and%20Acts/summary_of_mello-roos_act.pdf
Robert Wood Johnson Active Living by Design Foundation Grants	July	Up to \$6 million for 2010 cycle	Local funding source required	Projects must be nominated by a local grantmaker committed to participating as one of the funding partners.	C, SE	Funding for new programs only; projects must improve the health of vulnerable people in their communities. www.rwjf.org/applications/solicited/cfp.jsp?ID=20605

Key to Acronyms

AGENCIES

- BAAQMD: Bay Area Air Quality Management District
- Caltrans: California Department of Transportation
- ABAG: Association of Bay Area Governments
- ACTIA: Alameda County Transportation Improvement Authority
- MTC: Metropolitan Transportation Commission
- ACCMA: Alameda County Congestion Management Agency
- CTC: California Transportation Commission
- FHWA: Federal Highway Administration
- State DPR: California Department of Parks and Recreation (under the State Resources Agency)
- (Alameda County) PWA: Public Works Agency
- HUD: U.S. Department of Housing and Urban Development

FUNDING SOURCES

- CMAQ: Congestion Management and Air Quality
- SAFETEA-LU: Safe Accountable Flexible, Efficient Transportation Equity Act: A Legacy for Users

OTHER

- STIP: State Transportation Improvement Program
- MPO: Metropolitan Planning Organization
- CBO: Community-Based Organization

6. Other Resources

CHAPTER GUIDE

TOPIC: A collection of additional pedestrian resources, including toolkits and reference guides, developed by agencies and organizations within Alameda County and beyond.

AUDIENCE: Public agency planners and engineers, pedestrian advocates and community-based organizations.

EXISTING PEDESTRIAN TOOLKITS AND RESOURCES

There are many excellent pedestrian toolkits and resources that have been developed by other public agencies and non-profit organizations. These documents are grouped below into online resources and printed documents.

Online resources

Pedestrian and Bicycle Information Center (PBIC)

Excellent general online resource and starting point for pedestrian and bicycle information. The PBIC provides research, policy recommendations, design recommendations, pedestrian safety information as well as information on many other pedestrian-related topics.

- ▶ Pedestrian and Bicycle Information Center (PBIC)
www.walkinginfo.org

A Resident's Guide for Creating Safe and Walkable Communities

This guide, prepared for FHWA in 2008, is intended to assist residents, parents, community association members, and others in getting involved in making

communities safer for pedestrians. The guide includes information, ideas, success stories and resources, such as fact sheets, worksheets and sample materials for community distribution.

- ▶ A Resident's Guide for Creating Safe and Walkable Communities
www.walkinginfo.org/library/details.cfm?id=4163

Pedsafe: The Pedestrian Safety Guide and Countermeasure Selection System (2004)

An online toolkit and guide for pedestrian safety, which presents problems and solutions (known as "countermeasures") for specific pedestrian-related challenges. The website also includes resources for creating a viable pedestrian system, crash and statistical analysis, implementation strategies, case studies of implemented treatments, and access to a printable version of the guide.

- ▶ Pedsafe: Pedestrian Safety Guide and Countermeasure Selection System
www.walkinginfo.org/pedsafe

Pedestrian and Bicycle Facilities in California, Technical Reference Report (2004)

Intended for Caltrans staff, but useful for all public agency staff interested in pedestrian design, this reference guide for pedestrian design in California presents guidelines for designing Caltrans facilities with pedestrians (and bicyclists) in mind.

- ▶ Pedestrian and Bicycle Facilities in California, Technical Reference Report
www.dot.ca.gov/hq/traffops/survey/pedestrian/TR_MAY0405.pdf

Other Resources

MTC Pedestrian Safety Toolbox

An online toolkit for increasing pedestrian safety, which focuses on education, engineering and enforcement. The toolbox has a Bay Area focus and provides local examples for many of its solutions.

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- ▶ MTC Pedestrian Safety Toolbox
www.mtc.ca.gov/planning/bicyclespedestrians/safety/overview.htm
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Pedestrian Safety Guide for Transit Agencies

This guide, developed for FHWA in 2008, is intended for transit agency staff. The guide addresses common pedestrian safety issues near transit stations and bus stops, as well as descriptions of best practices in engineering, education, and enforcement as applied by transit agencies. General information on pedestrian safety and access to transit is also provided as well as references to publications, guides and other tools.

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- ▶ Pedestrian Safety Guide for Transit Agencies
http://safety.fhwa.dot.gov/ped_bike/docs/fta.pdf
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Accessible Public Rights-of-Way Planning and Designing for Alterations (2007)

The Public Rights-of-Way Access Advisory Committee (PROWAAC) to the US Access Board issued this special report, which highlights model right-of-way design alternatives, design processes for making alterations, design solutions to specific problems, and case studies demonstrating examples of accessible design practices from across the country.

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- ▶ Accessible Public Rights-of-Way: Planning and Designing for Alterations (2007)
www.access-board.gov/provac/alterations/guide.pdf
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Printed documents

AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities (2004)

A guide for pedestrian facility design, operation and maintenance from the American Association of State Highway and Transportation Officials. The AASHTO Guide provides guidelines that are used nationwide for the design of pedestrian facilities.

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- ▶ AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities
https://bookstore.transportation.org/item_details.aspx?ID=119

ISBN: 1-56051-293-8

Price: \$90 non-member; \$75 member

ITE Alternative Treatments for At-Grade Pedestrian Crossings (2001)

A comprehensive guide from the Institute of Transportation Engineers for at-grade pedestrian crossings. The guide summarizes pedestrian crossing treatments in use in the United States, Canada, Europe, New Zealand and Australia and summarizes the results of studies conducted by local agencies on the effects of these treatments. The guide's appendix includes crosswalk placement policies and signing and striping plans of selected agencies.

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- ▶ ITE Alternative Treatments for At-Grade Pedestrian Crossings
www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=LP-629

Item: LP-629

Price: \$40 non-member; \$30 member

MODEL RFPs

Requests for Proposals (RFPs) are developed and distributed by entities seeking consulting firms to provide professional services. Pedestrian plan RFPs should detail the plan's desired components (see pedestrian master plans section of Chapter 1). Links to a variety of pedestrian planning RFPs are provided at: www.actia2022.com/bikeped.html

RESOURCES FOR ELECTED OFFICIALS

There are a number of resources available for elected officials who are concerned with the pedestrian environment, including the previously listed online resources. In addition, organizations such as the American Planning Association, Local Government

Commission and Healthy Transportation Network welcome planning commissioners and other officials at their events.

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- ▶ Healthy Transportation Network
www.healthytransportation.net/about.html
 - ▶ Local Government Commission
www.lgc.org
 - ▶ Walkable Community Workshop (National Center for Bicycling and Walking)
www.bikewalk.org/workshopswalkable.php
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PROFESSIONAL DEVELOPMENT AND TRAINING

Professional associations, federal agencies, academic institutions and non-profit organizations offer resources and training to transportation professionals involved with pedestrian planning and facility design.

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- ▶ Association of Pedestrian and Bicycle Professionals training programs
www.apbp.org/?page=Pro_Dev
 - ▶ FHWA course on Bicycle and Pedestrian Transportation
www.walkinginfo.org/rd/planning.cfm#course
 - ▶ UC Davis extension courses
<http://universityextension.ucdavis.edu/landuse>
 - ▶ UC Berkeley Technology Transfer Course: Designing Safe and Accessible Pedestrian Facilities
https://registration.techtransfer.berkeley.edu/wconnect/ace/custom/pdf/te_20.pdf
 - ▶ National Complete Streets Coalition Complete Streets Workshops
www.apbp.org/resource/resmgr/complete_streets/complete_streets_workshop_fl.pdf
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PEDESTRIAN PLANNING FIRMS WORKING IN ALAMEDA COUNTY

There are many firms in the Bay Area and beyond that specialize in pedestrian planning and engineering. Local agencies and others looking for firms to develop

pedestrian plans or work on other pedestrian projects can use the link below.

www.actia2022.com/bikeped.html

LOCAL PEDESTRIAN CONTACTS

The link below provides a list of engineering and planning staff who work on pedestrian issues in Alameda County jurisdictions.

www.actia2022.com/bikeped.html

COMMUNITY-BASED ORGANIZATIONS AND ADVOCACY GROUPS

The list below provides information primarily about Alameda County groups focused on improving the pedestrian environment. The list also includes links to some national and state advocacy groups.

Organization	Mission	Contact Information
Albany Strollers & Rollers	An online advocacy group focused on improving bicycling and walking in Albany	http://sites.google.com/site/albanystrollersandrollers/
America Walks	A national coalition of local advocacy groups dedicated to promoting walkable communities	www.americawalks.org
California Walks	Coalition of pedestrian advocacy groups throughout California	www.californiawalks.org
California Pedestrian Advisory Committee (CalPed)	Committee of transportation professionals and pedestrian advocates that advises Caltrans.	Richard Haggstrom Caltrans Pedestrian and Bicycle Safety Branch (916) 654-6600
Pedestrian Friendly Alameda	Pedestrian advocacy in City of Alameda	2620 Clay St. Alameda, CA 94501 (510) 522-0819 Email: contact@pedfriendly.org Web: www.pedfriendly.org
TransForm	Mission includes, among other items, bicycle/pedestrian access and safety and safe routes to schools and transit throughout the Bay Area	436 14 th Street, Ste. 600 Oakland, CA 94612 Tel: 510.740.3150 www.transformca.org
United Seniors of Oakland and Alameda County	Improves walking access and safety for senior citizens in north and central Alameda County.	Tel: 510-729-0852 Email: usoac@usoac.org Web: www.usoac.org
Walk and Roll Berkeley	Pedestrian advocacy in Berkeley	Wendy Alfsen P.O. Box 13143 Berkeley, CA 94712 (510) 883-9725 Email: wrb@americawalks.org
Walk Oakland Bike Oakland (WOBO)	Works to improve neighborhood quality of life in the City of Oakland by making walking and biking safe, easy, accessible and fun.	www.walkoaklandbikeoakland.org/pages/page.php?pageid=1

GLOSSARY OF TERMS AND ACRONYMS

Arterials	Major roadways designed to carry large volumes of traffic through and between cities. Traffic on arterials is generally controlled by traffic signals. Examples of arterials in Alameda County include San Pablo Avenue, Hesperian Boulevard, East 14 th Street and Fremont Boulevard.
Audible pedestrian signals	Pedestrian signals that provide a distinctive sound to guide visually impaired pedestrians in crossing the street.
Bulb-out	Where curb, gutter and sidewalk extend into the parking lane, usually in order to shorten pedestrian crossing distance and make pedestrians more visible to drivers.
California Vehicle Code	The body of State law in California which regulates all roadway users.
Chicane	A traffic calming device which slows traffic by forcing it to divert from a straight path of travel, often into another lane. Chicanes are often built as chokers, narrowing the travel lane. See also Choker.
Choker	A traffic calming device which slows traffic by narrowing the roadway from both directions, constricting traffic into one center lane. See also Chicane.
Collectors	Secondary streets designed to bring motor vehicle traffic to arterial roadways. Collector streets are generally designed for travel to or within a neighborhood but not for long distance travel. Collectors are narrower than arterials but are generally wider than local streets. Collectors may be controlled by traffic signals or stop signs.
Complete streets	Roadway design that considers all users, including not just motor vehicles, including pedestrians, bicyclists, and transit riders.
Crossing treatment	The techniques used at roadway intersections to facilitate safe and convenient pedestrian movement, including crosswalk markings, median refuges, and curb extensions.
Curb extension	See Bulb-out.
Curb radius	The radius of the imaginary circle drawn by continuing the curve of a curb along a street corner. The bigger the radius, the farther pedestrians will have to cross the street and the faster motor vehicles will turn the corner.
Curb ramp	A combined ramp and landing pad that allows wheeled users to travel easily between street and sidewalk levels.
Free right turns	Right turn lanes which allow vehicles turning right to avoid passing through the intersection. Also know as slip turns.
General Plan	The adopted document that guides a jurisdiction's development. Under California law, each city and county must maintain a current General Plan that includes a land use, transportation, housing and other required elements. The General Plan is a community's broadest statement of how it intends to structure its land use and transportation networks.
Grade separation	Where two surfaces are separated by virtue of being at different vertical elevations, typically to separate pedestrians from automobiles and bicycles. Examples include sidewalks and pedestrian overpasses and underpasses.
Infill	Development in an area that is already developed (although the specific site may not have been previously developed).
Intermodal	A place where transfers occur between different types of transportation, such as bus and rail.
Mode	A type of transportation. Travel modes include automobile, bicycle, bus, ferry, rail and walking (pedestrian). Many trips, especially transit trips, involve more than one mode, and

Other Resources

	are usually classified by the mode that covers the longest distance.
Multi-modal	Incorporating many types of transportation.
MUTCD	Manual on Uniform Traffic Control Devices, a publication of the Federal Highway Administration that establishes national standards for traffic control.
Raised crosswalk	A high-visibility crosswalk painted on a raised hump, generally at least ten feet wide, six-to-eight inches high, and aligned with the curb, which allows pedestrians to be more visible to motorists and forces motorists to slow down even when pedestrians are not present.
Refuge Island	A raised island in the center of a roadway that provides a safe place for pedestrians to wait between crossing the two directions of traffic.
Right-of-way (ROW)	The right which one has to pass across the lands of another. An easement.
Routine Accommodation	Specific policies supporting or requiring the consideration of pedestrians in all phases of building transportation facilities.
Smart growth	Compact, mixed-use, development within existing developed areas, which is designed to minimize the amount of land consumed and to maximize opportunities for travel by means other than driving alone. Transit-oriented development is a common type of smart growth.
Specific plan	A specific plan guides a community's development in a focused neighborhood or district. The policies put forth in a specific plan are more detailed and geographically specific than those found in a General Plan.
Speed hump	A traffic calming treatment which uses a gradual rise in the roadway to cause vehicles to slow in order to pass over it safely. The gradual sloping shape of the speed hump does not jolt vehicles or bicycles abruptly, as do speed bumps.
SPUI	A Single Point Urban Interchange is a modified diamond interchange, where all traffic meets at a single traffic signal in the center of the interchange. The SPUI design allows opposing left turns to proceed concurrently, allowing for greater capacity within a smaller right-of-way footprint. Standard SPUI signal timing does not include a phase for pedestrian crossing (as it would decrease efficiency).
Tactile warning	A surface treatment, usually at a curb ramp or any unexpected edge, such as a rail platform, to warn those with vision impairments.
Traffic circle	An intersection with a circular shape which forces vehicles entering the intersection to curve around a central island. Traditional traffic circles are controlled by yield signs, allowing vehicles to merge at higher speeds than if they were required to stop before entering the intersection. Variations on this design control traffic with stop signs or traffic signals, thus using the central island to slow and direct traffic, rather than to provide a continuous flow of traffic around the circle.
Transit-oriented development (TOD)	Housing, commercial or mixed-use development sited and designed, in large part, to take advantage of adjacent or nearby transit service, such as a rail station or bus hub.
Urban design	The element of city planning that concerns how buildings and other features are physically arranged in a city. Many cities have urban design guidelines that seek to make streets and neighborhoods attractive and pedestrian-friendly. These guidelines regulate such matters as buildings' relationship to the sidewalk, location of building doors, setbacks on upper stories of buildings, etc.

