



Chapter 1025

Pedestrian Design Considerations

- 1025.01 General
- 1025.02 References
- 1025.03 Definitions
- 1025.04 Policy
- 1025.05 Pedestrian Facility Design
- 1025.06 Documentation

1025.01 General

Pedestrians are present on most highways and transportation facilities, yet their travel mode differs vastly and sometimes is in conflict with the requirements for vehicular travel. Pedestrian travel is a vital transportation mode. It is used at some point by nearly all citizens and is the main link to everyday life for many others. Pedestrians vary in their physical abilities; this variation must be accommodated in design to allow near universal access. Keep the pedestrian space free of obstacles. In areas of heavy snowfall, avoid using the pedestrian space for snow storage. The challenge is to provide safe and efficient facilities that address these two interests within a limited amount of right of way.

1025.02 References

(1) Law

Laws and codes (both federal and state) that may pertain to this chapter include the following:

23 *Code of Federal Regulations* (CFR) Part 652

28 CFR Part 35

28 CFR Part 36, Appendix A, as revised July 1, 1994

49 CFR Part 27 (Authority: Section 504 of the Rehabilitation Act of 1973, as amended – 29 USC 794)

Manual on Uniform Traffic Control Devices, USDOT, FHWA; including the *Washington State Modifications* to the MUTCD, Chapter 468-95 WAC, (MUTCD).

<http://www.wsdot.wa.gov/biz/trafficoperations/mutcd.htm>

Revised Code of Washington (RCW) 35.68, “Sidewalks, Gutters, Curbs and Driveways – All Cities and Towns”

RCW 35.78, “Streets – Classification and Design Standards”

RCW 46.04.160, “Crosswalk”

RCW 46.61.235, “Crosswalk”

RCW 46.61.240, “Crossing at other than crosswalks”

RCW 46.61.261, “Sidewalks, Crosswalks – Pedestrians, Bicycles”

RCW 47.24.010, City streets as part of state highways, “Designation – Construction, maintenance – Return to city or town”

RCW 47.24.020, City streets as part of state highways, “Jurisdiction, control”

RCW 47.30.030, “Facilities for Non-Motorized Traffic”

RCW 47.30.050, “Expenditures for Paths and Trails”

(2) Design Guidance

The following contain guidance that is included by reference within the text:

Roadside Manual, M 25-30, WSDOT

Standard Plans for Road, Bridge, and Municipal Construction (Standard Plans), M 21-01, WSDOT

Understanding Flexibility in Transportation Design – Washington, WSDOT, 2005

(3) Supporting Information

The following were used in the development of this chapter or contain additional information:

A Policy on Geometric Design of Highways and Streets (Green Book), AASHTO, 2001

Accessible Rights-of-Way; A Design Guide, U.S. Access Board, Washington D.C.

Building a True Community: Accessible Public Rights-of-Way (Draft,) U.S. Access Board, Washington D.C.

Design Guidance, Accommodating Bicycle and Pedestrian Travel. A Recommended Approach, USDOT Policy Statement, 2001

Designing Sidewalks and Trails for Access Part II of II: Best Practices Design Guide, USDOT, FHWA, 2001

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

Highway Capacity Manual, Transportation Research Board (TRB), 2000


Pedestrian Facilities Users Guide – Providing Safety and Mobility, FHWA, 2002

Pedestrian Facilities Guidebook: Incorporating Pedestrians into Washington's Transportation System, OTAK, 1997

1025.03 Definitions

accessible route A continuous unobstructed pedestrian route that connects accessible elements and spaces of a building or facility. Exterior accessible routes include parking access aisles, sidewalks, sidewalk ramps, and crosswalks at vehicular ways, walkways, ramps, paths, trails, and lifts.

ADA An abbreviation for the Americans with Disabilities Act of 1990. The ADA is a civil rights law that identifies and prohibits discrimination based on disability. The ADA requires public entities to design new facilities or alter existing facilities, including sidewalks and trails that are accessible to people with disabilities.

ADAAG ADA Accessibility Guidelines. The guidelines contain requirements that apply to new construction and alterations. Refer to the following web site 
<http://www.access-board.gov/prowac/guide/PROWGuide.htm>

Bituminous Surface Treatment (BST) A bituminous surface treatment, also known as a seal coat or chip seal, is a thin protective wearing surface that is applied to a pavement or base course. BSTs can provide a waterproof layer to

protect the underlying pavement; increased skid resistance; a fill for existing cracks or raveled surfaces; an anti-glare surface during wet weather; and an increased reflective surface for night driving. BSTs are primarily used for preventative maintenance and waterproofing of the existing pavement.

crosswalk A crosswalk is defined as:

1. The portion of the roadway between the intersection area and a prolongation or connection of the farthest sidewalk line or, in the event there are no sidewalks, then between the intersection area and a line ten feet therefrom, except as modified by a marked crosswalk (RCW 46.04.160).
2. (a) That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable roadway, and in the absence of a sidewalk on one side of the roadway, the part of the roadway included within the extension of the lateral lines of the sidewalk at right angles to the center line. (b) Any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by lines on the surface, which may be supplemented by contrasting pavement texture, style, or color. (MUTCD, 2003)

curb extension A curb and sidewalk bulge or extension out into the parking lane, or shoulder used to decrease the length of a pedestrian crossing and increase visibility.

detectable warning A tactile surface that can be detected by vision-impaired pedestrians. The detectable warning signals a change in the pedestrian environment, where the pedestrian is moving into a vehicular traffic area, railroad crossing, or vertical drop-off at a transit loading facility. The only acceptable warnings are truncated domes. The detectable warning must contrast with the surrounding surface.

flangeway gap The space between the inner edge of a rail and the crossing surface. The gap is of sufficient space to permit a rail car wheel to pass through; approximately 3 inches. If there is insufficient space, a derailment is possible.

landing A level area, 4 feet by 4 feet (not steeper than 2% slope in any direction), at the top and bottom of a pedestrian ramp.

midblock pedestrian crossing A marked pedestrian crossing located between intersections.

pedestrian facilities Walkways such as sidewalks, highway shoulders, walking and hiking trails, shared-use paths, pedestrian grade separations, crosswalks, and other improvements provided for the benefit of pedestrian travel. Pedestrian facilities are intended to be accessible routes.

pedestrian refuge island A raised area between traffic lanes that provides a place for pedestrians to wait to cross the roadway. Wheelchair access (cut-through) must be provided in all pedestrian refuge islands.

raised median A raised island in the center of a road used to restrict vehicle left turns and side street access. Pedestrians often use this median as a place of refuge when crossing a roadway. Raised medians must include wheelchair access (cut through).

rural area An area that meets none of the conditions to be an urban area.

suburban area A term for the area at the boundary of an urban area. Suburban settings may combine the higher speeds common in rural areas with activities that are more similar to urban settings.

traffic calming A set of self-enforcing engineered techniques designed to reduce the speed and aggressiveness of traffic. Strategies include lane narrowing, sidewalk extensions, surface variations, and visual clues in the vertical plane.

train dynamic envelope The clearance required for a train and its cargo overhang due to any combination of loading, lateral motion, or suspension failure.

truncated domes Truncated domes are small raised protrusions of between 7/8 inch and 1 7/16 inch in diameter and 3/16 inch in height arranged in a distinctive pattern that is readily detected and recognized by a vision-impaired person using a cane for guidance. The Standard Plans show the appropriate pattern and dimensions.

urban area An area defined by one or more of the following:

- An area including and adjacent to a municipality or other urban place having a population of 5000 or more, as determined by the latest available published official federal census (decennial or special), within boundaries to be fixed by a state highway department, subject to the approval of the FHWA.
- Within the limits of an incorporated city or town.
- Characterized by intensive use of the land for the location of structures and receiving such urban services as sewer, water, and other public utilities and services normally associated with an incorporated city or town.
- With not more than 25% undeveloped land.

1025.04 Policy

(1) General

Pedestrian facilities are required along and across sections of state routes and city streets, and are an integral part of the transportation system. FHWA policy (23 CFR 652.5) suggests that safe bicycle and pedestrian facilities be given full consideration on all federal aid highway improvement projects. Provide ADA-compliant pedestrian facilities on highway projects unless one or more of the three conditions below are met:

- Pedestrians are prohibited by law from using the facility.
- The cost of the improvements is excessive and disproportionate to the original need or probable use (as a guide, more than 20% of the project estimate). In these instances, evaluate options to modify the scope of the pedestrian improvements or investigate funding for a separate pedestrian project. Any improvement must comply with ADA accessibility requirements. Include documentation of the results of the investigation for funding a separate pedestrian project.
- Low population density or other factors (such as a lack of pedestrian generators within a quarter-mile radius of the project) indicate there is no need.

Consider whether the project is within a city or an urban growth area that is intended to be ultimately developed as an urban density area, which will be served by urban services including transit. Inside incorporated cities, design pedestrian facilities in accordance with the city design standards adopted in accordance with RCW 35.78.030. Exceptions to adopted design standards require a deviation approved by the designated authority identified in Chapter 330.

(2) Jurisdiction

When city streets form a part of the state highway system within the corporate limits of cities and towns, the city has full responsibility for and control over any such street beyond the curbs and, if no curb is installed, beyond that portion of the highway used for highway purposes. (See RCW 47.24.020.) Proposed projects that will damage or remove existing sidewalks or other walkways within the city's jurisdiction must include reconstruction of these facilities. This jurisdictional distinction does not relieve the agency (or agencies) initiating a project from addressing ADA compliance.

The title to limited access facilities within incorporated cities and towns remains with the state. Within these areas the state maintains full jurisdiction, responsibility, and control as provided in RCW 47.24.20.

(3) Full Access Control

Walking and hiking trails and shared-use paths within the right of way are separated from vehicular traffic with physical barriers. These facilities can connect with other facilities outside the right of way once proper documentation has been obtained. Contact HQ Real Estate Services to determine the required documentation. Grade separations are provided when the trail crosses the highway.

(4) Partial or Modified Access Control

Walking trails and shared-use paths may be located between the access points of interchanges or intersections. Pedestrian crossings are usually either at grade with an intersecting crossroad or a grade separation. Consider midblock pedestrian crossings at pedestrian generators when the

roadway has the characteristics associated with an urban area and appropriate operational and geometric characteristics that allow for a crossing.

Consider providing sidewalks at signalized intersections. Evaluate extending sidewalks on a project-by-project basis.

(5) Managed Access Control

In rural areas, paved shoulders are usually used for pedestrian travel. When pedestrian activity is high, separate walkways may be provided. Sidewalks are used in urban growth areas where there is an identified need for pedestrian facilities.

Consider providing sidewalks at signalized intersections. Evaluate extending sidewalks on a project-by-project basis.

Trails and paths, separated from the roadway alignment, are used to connect areas of community development. Pedestrian crossings are typically at grade.

(6) ADA Compliance

Detectable warnings are required on all vehicular roadway and railroad crossings intended for pedestrian use.

Improvement projects address the construction of a new roadway or produce major modifications to an existing roadway. In these projects, the pedestrian's needs are assessed and included, when applicable. Develop the pedestrian facilities consistent with the requirements listed in Figure 1025-2, using the ADA Standards for Improvement Projects column.

Preservation projects ~~on state highways~~ (except for BSTs) are considered alterations of the roadway. Address pedestrian needs and include, to the maximum extent feasible, access for persons with disabilities. If an existing sidewalk ramp adjacent to the roadway meets the ADA minimums for preservation projects in the Preservation Projects column in Figure 1025-2, no further action is required. If an existing ramp does not meet the ADA minimums, then it will need to be removed and constructed or modified to meet the standards for improvement projects, unless installing truncated domes would meet requirements.

It is not always feasible or even possible to build pedestrian facilities to full ADA standards (as shown in the column ADA Standards for Improvement Projects) in preservation projects or alterations. When this is the case, the ADA minimums for preservation projects are applicable.

In these circumstances, the alteration shall provide the maximum physical accessibility feasible. Any altered features of the facility that can be made accessible shall be made accessible.

When a preservation project is going through an area with pedestrian facilities that meet these requirements, no other action is necessary at this time. The agency (or agencies) initiating the project is responsible for funding this work.

1025.05 Pedestrian Facility Design

(1) Facilities

The type of pedestrian facility provided is based on local transportation plans, the roadside environment, pedestrian volumes, user age group, safety-economic analysis, and continuity of local walkways along or across the roadway. Sidewalks can be either immediately adjacent to streets and highways or separated from them by a buffer.

The type of walkway also depends on the access control of the highway as follows:

(2) Pedestrian Travel Along Streets and Highways

(a) **General.** Examples of various types of pedestrian walkways are shown in Figures 1025-3a and 3b. A generalized method of assessing the need for and adequacy of pedestrian facilities can be found in Figure 1025-4. These guidelines do not establish minimum requirements. Consider a study which addresses roadway classification, traffic speed, crash data, pedestrian generators, school zones, transit routes, and land use designation to assist in facility choices.

The minimum clear width for an ADA-accessible route is 4 feet. Utility poles and other fixtures located in the sidewalk can be obstacles for pedestrians with disabilities. To the maximum extent possible, provide a continuous unobstructed route for pedestrians

with disabilities. When an unobstructed route is not feasible, provide an ADA-compliant route around these obstructions. When relocation of these utility poles and other fixtures is necessary in a project, determine the impact of their new location on any pedestrian walkways. Utility vaults and junction boxes with special lids are used for installations in sidewalks to reduce tripping hazards. Improvement projects might provide opportunities to eliminate existing utilities that are obstructions in the pedestrian route.

Hanging or protruding objects within the walkway present obstacles for pedestrians with visual impairments. The minimum vertical clearance for objects overhanging a walkway, including signs, is 7 feet. Objects that protrude more than 4 inches into the walkway are considered to be obstacles, and warning devices are necessary. Wall-mounted and post-mounted objects that protrude 4 inches or more into the walkway between 27 inches and 80 inches above the sidewalk shall be equipped with warning devices detectable by persons with impaired vision using a cane.

Where the walkway is located behind guardrail, cut off protruding guardrail bolts or install a rub rail to prevent snagging on the bolts. Specify these construction requirements in the contract.

Provide a smooth finish to vertical concrete surfaces adjacent to a pedestrian facility to prevent snagging or abrasive injuries from accidental contact with the surface.

(b) **Shoulders.** Paved shoulders are an acceptable pedestrian facility along rural roadways. Pedestrian activity is usually minimal along rural roadways. Determine if the roadway's shoulders are of sufficient width and condition to permit safe travel for pedestrians. In urban areas, a shoulder can provide a buffer between the vehicle and the pedestrian facility. Paved shoulders are preferable for an all-weather walking surface and for ADA compliance. A 4-foot-wide shoulder is acceptable where pedestrian activity is minor. Wider shoulders, up to 8 or 10 feet, are desirable along high-speed highways, particularly when truck volumes are high or pedestrian activities are high. Longitudinal travel along shoulders with cross

slopes greater than 2% can be difficult for people with mobility disabilities. Horizontal curves are usually superelevated and can have cross slopes steeper than 2%. The shoulders on these curves often have the same cross slope as the roadway. In rural areas, the probability of a shoulder being used by someone in a wheelchair is remote. However, if pedestrians use the shoulder frequently, consider flattening the shoulder cross slope or provide a separate pedestrian route. (See Chapter 640 when flattening the shoulder slope.)

(c) **Shared-Use Paths.** Shared-use paths are used by pedestrians and bicyclists. Shared-use paths that function as sidewalks must comply with ADA sidewalk requirements. Pedestrian facilities differ from bicycle facilities in their design requirements and goals, and they are not always compatible. When it is determined that a shared-use path is in the best interests of both groups, see Chapter 1020, “Bicycle Facilities.”

(d) **Walking Trails.** Walking trails are considered on a project-by-project basis. Trails that function as sidewalks are required to meet ADA standards, and they may be unpaved. Unpaved trails, to the maximum extent possible, shall be firm and stable allowing potential wheelchair accessibility. (See Figure 1025-1 for trail width, vertical clearance, and grade guidelines.) The clear area is the cross-sectional area of the trail that is cleared of limbs, exposed roots, brush, and other obstacles that might be obstructions.

	Clear Area	Trail Width	Maximum Grade
Walking Trail	8' high & 6' wide	4'	10%
* Note: When grades of 5% or more are used, provide 5-foot-square resting areas adjacent to the trail every 200 feet.			

Walking Trail Guidelines
Figure 1025-1

(e) **Sidewalks.** Details for raised sidewalks are shown in the *Standard Plans*. Wherever appropriate, make sidewalks continuous and provide access to side streets. The most desirable installation for the pedestrian is a sidewalk separated from the traveled way by a planted buffer strip. Consider buffer strips of 4 feet for collector routes and 6 feet for arterial routes. If trees or shrubs are included, make sure they do not limit the visibility of motorists or pedestrians or pose hazards for persons with disabilities. (See Chapter 920.) Shoulders, bike lanes, and on-street parking can also be used to provide an adequate buffer zone for pedestrian facilities. The minimum clear width for the sidewalk is 5 feet. (See the *Standard Plans*.) Where a sidewalk is separated from the traveled way with only a curb, the minimum sidewalk width is 6 feet. Wider sidewalks are preferable in areas of high pedestrian traffic, such as a central business district (CBD), and along parks, schools and other major pedestrian generators. Sidewalks 10 to 15 feet wide may be more appropriate at these locations. Coordinate with the city for appropriate sidewalk width and participation.

In areas with heavy snowfall, consider wider sidewalks or a sidewalk with a buffer to provide snow storage and to minimize the disruption to pedestrian travel. Sidewalks and trails must be maintained to ADA requirements; thus, ensure that maintenance access is not obstructed. Consider limiting or consolidating driveways (vehicle access points). Driveways are to be constructed in accordance with ADA requirements, or provide an ADA-accessible route.

(See Chapter 1420 for access control information, and the *Standard Plans* for vehicle approach details and ADA requirements.)

Consider sidewalk enhancements such as unobstructed visibility for both motorists and pedestrians to encourage walkway use and increase pedestrian comfort.

A grade of 8.33% or less is required when the sidewalk is on an independent alignment and does not follow an adjacent roadway grade. Sidewalks located adjacent to a street or highway shall not exceed that facility's grade. On roadways with prolonged severe grades, provide railings and, to the maximum extent possible, level landings adjacent to the sidewalk at approximately 200-foot intervals as resting areas for people with physical disabilities. Design sidewalks with cross slopes no more than 2%. Steeper cross slopes are difficult for people in wheelchairs to negotiate.

The side slope adjacent to the sidewalk is a critical design element. (See Figures 1025- 3a and 3b.) On embankment slopes of 4H:1V or flatter, provide a 1-foot widening at the back of the sidewalk. On steeper embankment slopes, provide a 4-foot embankment widening or use a sidewalk design with a 2-foot widening and a raised 4-inch-high lip at the back edge of the sidewalk. When the adjacent roadway has a posted speed of 35 mph or less and there is a vertical drop-off of 2 feet 6 inches or more directly behind the sidewalk, provide a pedestrian railing when embankment widening is not possible. (See Figure 1025-3b.) Pedestrian railings are not always designed to withstand vehicular impacts or redirect errant vehicles. When a vertical drop-off is present on a higher-speed roadway, the Design Clear Zone is the primary consideration and a crash-worthy traffic barrier is required if within the Design Clear Zone. (See Chapter 700.) Where the walkway is adjacent to a vertical drop-off and is separated from the roadway, consider installing the traffic barrier between the traveled way and the walkway. The pedestrian railing is then installed between the walkway and the vertical drop-off.

(f) **Vehicle Bridges and Underpasses.** Provide provisions for pedestrians on vehicle bridges and underpasses where pedestrians are not prohibited; contact the HQ Bridge and Structures Office. Provide either raised sidewalks or ramps on the approaches to bridges when there are raised sidewalks on the bridge. The ramp is constructed of either asphalt or cement concrete and has a slope of 20H:1V or flatter. These ramps can also

be used as a transition from a raised sidewalk down to a paved shoulder. The ramp provides pedestrian access and mitigates the raised, blunt end of the concrete sidewalk.

In underpasses where pedestrians are not prohibited, providing sidewalks and maintaining the full shoulder width is desirable. When bridge columns are placed on either side of the roadway, consider placing the walkway between the roadway and the columns for pedestrian visibility and security. Adequate lighting and drainage are important for pedestrian safety and comfort.

(g) **Railroad Crossings.** Crossing railroad tracks can be difficult or even impossible for a person who requires a wheelchair, crutches, or walking aids for mobility. The concrete or rubber railroad crossings required to permit vehicle travel are extended into the shoulders of the roadway to enhance pedestrian travel. When a raised sidewalk is adjacent to the roadway, provide ramps to bring the pedestrian walkway down to the same grade as the roadway. Whenever possible, make crossings perpendicular to the tracks. In this type of installation, the truncated domes are placed at the outside edges of the train's dynamic envelope and are not placed at the bottom of the sidewalk ramp. Keep flangeway gaps to no more than 2.5 or 3 inches.

(3) **Pedestrian Crossings At Grade**

(a) **General.** The chart in Figure 1025-5 provides recommendations for determining pedestrian markings based on vehicular traffic volume and speed. Minimum lighting requirements and additional requirements are also recommended in this chart.

Pedestrian crossings are permitted along the length of most highways. Pedestrian crossing of all legs of an intersection is also permitted. An illegal pedestrian crossing only occurs when signs prohibit a particular crossing at an intersection or the crossing occurs between two adjacent signalized intersections. (See RCW 46.61.240.) When considering prohibiting a pedestrian crossing, ensure a reasonable alternative crossing is provided.

(b) **Crosswalks.** Crosswalks, whether marked or not, exist at all intersections. An unmarked crosswalk is the 10-foot-wide area across the intersection behind a prolongation of the curb or edge of the through traffic lane. (See RCW 46.04.160.) A marked crosswalk is required when the intended pedestrian route is different than that cited in the RCW. (See Figure 1025-5.) At roundabouts and intersections with triangular refuge islands or offset legs, the desired pedestrian crossings might not be consistent with the definition of an unmarked crosswalk and markings become necessary. Inside city limits where the population exceeds 22,500, the decision to mark crosswalks resides with the city subject to approval by WSDOT of the installation and type. In unincorporated areas and within cities with populations less than 22,500, WSDOT has decision authority.

Crosswalk lines are not to be used indiscriminately. Perform an engineering study before installing crosswalks away from highway traffic signals or stop signs. Evaluate the following factors at a minimum. Consider unmarked crossings as candidates for marking if:

- The crosswalk would serve 20 pedestrians per hour during the peak hour, 15 elderly and/or children per hour, or 60 pedestrians total for the highest consecutive 4-hour period.
- The crossing is on a direct route to or from a pedestrian generator, such as a school (see the MUTCD), library, hospital, senior center, community center, shopping center, park, employment center, or transit center. Generators in the immediate proximity of the highway are of primary concern. Pedestrian travel distances greater than 1/4 mile generally do not attract many pedestrians.
- The comprehensive plan includes the development of pedestrian facilities in the project vicinity.
- The location is 300 feet or more from another crossing.
- The location has decision sight distance and/or sight distance will be improved prior to marking the crossing. (See Chapter 650, "Decision Sight Distance.")
- Safety considerations do not preclude a crosswalk.

A significant pedestrian accident history may also warrant the installation or marking of a crosswalk.

For marked crosswalks, the standard crosswalk marking consists of a series of wide white lines aligned with the longitudinal axis of the roadway. Crosswalk widths of at least 6 feet and 10 feet are preferred in central business districts. The lines are positioned at the edges and centers of the traffic lanes to place them out of the normal wheel path of vehicles. This type of crosswalk is a longitudinal pattern known as a Ladder Bar and is shown in the Standard Plans. Designers are encouraged to set back stop and yield lines to ensure visibility. Stop and yield line dimensions and placement shall conform to the MUTCD.

Communities sometimes request specially textured crosswalks (consisting of colored pavement, bricks, or other materials) in community enhancement projects. These crosswalks do not always fall within the legal definition of a marked crosswalk and parallel white crosswalk lines might be necessary to define the crosswalk. (See the MUTCD or Local Agency Crosswalk Options web site, <http://www.wsdot.wa.gov/eesc/design/designstandards/psl/PM-2/pm-2.htm>.) Provide a non-slip surface, appropriate for wheelchair use.

When locating crosswalks at intersections, consider the visibility of the pedestrian from the motorist's point of view. Shrubbery, signs, parked cars, and other roadside appurtenances can block the motorist's view of the pedestrian. Figure 1025-7a illustrates these sight distance problems.

When designing crosswalks and pedestrian signals, consider the needs of older pedestrians and pedestrians with disabilities, as they might walk at a significantly slower pace than the average pedestrian. Include countdown clocks where appropriate to assist older and disabled pedestrians to determine the time remaining to cross. Determine if there are pedestrian generators in the project vicinity that might attract older and disabled pedestrians. Consult with the region's Maintenance Office regarding maintenance requirements for these devices.

Consider the use of ADAAG-compliant audible pedestrian signals where suitable for pedestrian safety. Determine if there are pedestrian generators in the project vicinity that might attract hearing-impaired pedestrians for which audible signals are appropriate. Consult with the region's Maintenance Office regarding maintenance requirements for these devices. (See Chapter 850 and the MUTCD for additional information.)

Wide, multilane streets are often difficult for pedestrians to cross, particularly when there are insufficient gaps in vehicular traffic because of heavy volumes. Consider the use of raised medians with cut-throughs on roadways with the following conditions:

- Two-way arterial street with high speeds and high average daily traffic (ADT), and large pedestrian volumes
- The crossing distance exceeds 60 feet
- Complex or irregularly shaped intersections

The minimum width of a raised median refuge area is 4 feet to accommodate people in wheelchairs. Raised medians that exceed the minimum are encouraged. Raised medians are usually too narrow to allow the installation of ramps and a level landing. When the median is 16 feet or less in width, provide a passageway wide enough to accommodate wheelchairs through the median. This passageway connects with the two separate roadways and cannot exceed a grade of 5%. Truncated domes are required on both sides of a median cut-through.

Design ramp terminals for both off-ramps and on-ramps as at-grade intersections. (See Chapters 910 and 940.)

For pedestrian safety, design turn lanes to ensure that turning speeds are kept low and sight distance is not compromised. Consider the following measures to help reduce conflict:

- Reduce turning radii
- Prohibit right turns on red
- Place crosswalks so they are visible and adjacent to the pedestrian facility
- Use a separate left-turn phase in conjunction with a "WALK/DON'T WALK" signal
- Restrict left turns at certain times

- Shorten crossing distance
- Use a raised median
- Use pedestrian signals
- Use signage
- Place crosswalks as close as practicable to the traveled way
- Provide pedestrian-level lighting

The island used for channelized right-turn slip lanes can provide a pedestrian refuge, but may promote faster turning speeds. To reduce conflicts, keep the lane as narrow as practical and attempt to maintain a 90° intersection angle. (See Chapter 910 for more information about turn lanes, Chapter 940 for more information about interchange ramps, and Chapter 915 for information about pedestrian accommodations in roundabouts.)

(c) **Managing Traffic Speed and Flow.** Curb extensions are a traffic calming measure that, when used appropriately, may increase pedestrian safety. In urban areas where vehicle speeds are in the range of 25 to 35 mph, a sidewalk curb extension is sometimes used as a traffic calming measure to help reduce traffic speeds. Parked cars can be a safety hazard for pedestrians by limiting driver visibility. Curb extensions can improve safety by placing the pedestrian at a more visible location, shortening the length of the pedestrian crossing, and reducing the pedestrian's exposure time. Curb extensions can also increase the effective sidewalk width at intersections. Extend the curb to the width of the parking lane. Consider low-level landscaping that does not create a sight obstruction and an approach nose. At intersections with traffic signals, the curb extension can be used to reduce pedestrian signal timing. Examples of sidewalk curb extensions are shown in Figure 1025-7b and 1025-8.

The right turn path of the design vehicle or the vehicle most likely to make this turn is a critical element in determining the size and shape of the curb extension. Sidewalk curb extensions tend to restrict the width of the roadway and can make right turns difficult for large trucks. Avoid interrupting bicycle traffic with curb extensions. If the route is identified as a local, state, or regional significant bike route, provide a

minimum shoulder width of 4 feet. (See Chapter 1020 for additional information.) Do not use curb extensions in any of the following circumstances on state highways:

- The Design Vehicle is required to encroach on curbs, opposing lanes, or same-direction lanes (see the *Design Vehicle* section in Chapter 910)
- Shoulder parking is not present
- The posted speed is above 35 mph

Plantings that obstruct neither pedestrian's nor driver's vision may be used as traffic calming measures by creating the illusion of narrow streets. Consider motorist and pedestrian visibility and Design Clear Zone requirements. (See Chapter 700.)

Traffic signal progressions can be used to address traffic speeds.

Consider narrower lane widths on portions of non-NHS two-lane routes to reduce the expanse of visible pavement to the motorist and help slow traffic when the following conditions exist:

- Within incorporated cities
- High pedestrian use

For minimum lane widths, see Chapters 430 and 440.

(d) **Midblock Crossings.** On roadways with pedestrian crossing traffic caused by nearby pedestrian generators, consider a midblock pedestrian crossing. (See 1025.05 (3)(b) for crosswalk criteria and Figure 1025-5 for marked crosswalk recommendations at unsignalized intersections.) The installation of a midblock pedestrian crossing on a state highway, however, is a design deviation that requires approval and documentation. An example of a midblock crossing is shown in Figure 1025-9.

Conditions that might favor a midblock crossing include:

- Significant pedestrian crossings and substantial pedestrian and vehicle conflicts occur.
- The proposed crossing can concentrate or channel multiple pedestrian crossings to a single location.

- The crossing is at an approved school crossing on a school walk route.
- The adjacent land use creates high concentrations of pedestrians needing to cross the highway.
- The pedestrians fail to recognize the best or safest place to cross along a highway and there is a need to delineate the optimal location.
- There is adequate sight distance for motorists and pedestrians.

Midblock pedestrian crossings on state highways are not desirable at the following locations:

- Immediately downstream (less than 300 feet) from an existing traffic signal where motorists do not expect a pedestrian to cross.
- Within 600 feet of another pedestrian crossing.
- Where pedestrians must cross three or more lanes of traffic in the same direction.

(4) Sidewalk Ramps

Sidewalk curb ramps are required at all intersections, unless pedestrians are prohibited from crossing the roadway and on midblock crossings where sidewalks are present. These ramps provide an easily accessible connection from a raised sidewalk down to the roadway surface. To comply with ADA requirements, these ramps are at least 4 feet wide and have slopes 12H:1V or flatter and a cross slope of not greater than 2%. Curb ramp flares do not exceed 10%. Examples of sidewalk curb ramps are shown in the Standard Plans.

The lower terminus of the sidewalk ramp is always located at the beginning of a marked or unmarked crosswalk when separate ramps are used for each direction. A separate sidewalk ramp is preferred for each crossing because the crossing distance is shorter and people with vision impairments or in wheelchairs have fewer difficulties with this arrangement. A single diagonal ramp, serving two crossings, is sometimes necessary where right of way constraints make the installation of separate ramps infeasible. The use of a diagonal ramp requires the approval of the region's Traffic Engineer. If

inside an incorporated city, the city must approve the use of a diagonal ramp. In all cases, detectable warning strips are to be installed.

Surface water runoff from the roadway can flood the lower end of a sidewalk ramp. Determine the grades along the curb line and provide catch basins or inlets to prevent the flooding of the ramps. Figure 1025-10 shows examples of how drainage structures are located. Verify that the drainage structure will not be in the path of a wheelchair user.

A level landing is necessary at the top and bottom of a sidewalk ramp. The top landing is provided to allow a person in a wheelchair room to maneuver into a position to use the ramp or to bypass it. The lower landing allows a wheelchair user to transition from the ramp to the roadway crossing. In preservation projects, the landings must be at least 3 feet square. In new construction, a 4-foot-square landing is required. When right of way constraints are not an issue, provide a larger 5-foot-square landing. If the landing is next to a vertical wall, a 5-foot-wide clear area is desirable to allow a person in a wheelchair more room to maneuver.

At signalized intersections, pedestrian push buttons are located near the sidewalk ramps for ADA accessibility. (See Chapter 850, "Traffic Control Signals," for information on pedestrian requirements at traffic signal locations.)

(5) Pedestrian Grade Separations

(a) **General.** In extreme cases where pedestrian need is high, consider providing a pedestrian grade separation along freeways and other high-speed facilities. When considering a pedestrian structure, determine if the conditions that require the crossing are permanent. If there is a likelihood that the pedestrian activity generator might not exist in the near future, consider less costly solutions. Locate the grade-separated crossing where pedestrians are most likely to cross the roadway. A crossing might not be used if the pedestrian is required to deviate significantly from a more direct route. A structure might be underutilized if the additional average walking distance for 85% of pedestrians exceeds 1/4 mile. It is sometimes necessary to install fencing or

other physical barriers to channel the pedestrians to the structure and reduce the possibility of undesired at-grade crossings. The Bridge and Structures office is responsible for the design of pedestrian structures.

Consider grade-separated crossings under the following conditions:

- Where there is moderate to high pedestrian demand to cross a freeway or expressway
- Where there are large numbers of young children, particularly on schools routes, who regularly cross high-speed or high-volume roadways
- On streets with high vehicular volumes and high pedestrian crossing volumes, and the crossings are extremely hazardous for pedestrians

(b) **Pedestrian Bridges.** Pedestrian grade-separation bridges are more effective when the roadway is below the natural ground line as in a "cut" section. Elevated grade separations, where the pedestrian is required to climb stairs or use long approach ramps, tend to be underutilized. Pedestrian bridges require adequate right of way to accommodate accessible ramps.

For the minimum vertical clearance from the bottom of the pedestrian structure to the roadway beneath, see Chapter 1120. This minimum height requirement can affect the length of the pedestrian ramps to the structure. To comply with ADA requirements, a ramp cannot have a grade exceeding 8.33%, and landings for resting areas are required every 2 feet 6 inches of rise or every 30 feet. Landings are a minimum of 5 feet long and shall not be less than the ramp width. When ramps are not feasible, provide both elevators and stairways. Stairways are designed in accordance with the Standard Plans.

Railings are provided on pedestrian bridges. Protective screening is sometimes necessary to prevent objects from being thrown from an overhead pedestrian structure. (See Chapter 1120, "Bridges.") Consider a clear width of 14 feet when a pedestrian bridge is enclosed or shared with bicycles.

(c) **Pedestrian Tunnels.** Tunnels are an effective method of providing crossings for

roadways located in embankment sections. When possible, design the tunnel with a nearly level profile to provide complete vision from portal to portal. Pedestrians are reluctant to enter a tunnel with a depressed profile because they are unable to see whether the tunnel is occupied. Police officers also have difficulty patrolling depressed profile tunnels. Provide vandal-resistant daytime and nighttime illumination within the pedestrian tunnel. Installing gloss-finished tile walls and ceilings can also enhance light levels within the tunnel. The minimum overhead clearance for a tunnel is 10 feet. Provide a tunnel width between 12 and 18 feet depending on usage and the length of the tunnel.

(6) Transit Stops

The location of transit stops is an important consideration in providing appropriate pedestrian facilities. (Contact the local transit provider for additional information.) Newly constructed transit stops must conform to ADA requirements. (See Chapter 1060, “Transit Benefit Facilities.”) Ensure that the transit stop is accessible from the sidewalk or paved shoulder. A transit stop on one side of a street usually has a counterpart on the opposite side because transit routes normally function in both directions on the same roadway. Provide adequate crossing facilities for pedestrians.

When locating transit stops consider the following:

- ADT
- Traffic speed
- Crossing distance
- Accident history
- Sight distance

If any of these suggest an undesirable location for a pedestrian crossing, consider a controlled crossing or another location for the transit stop.

When analyzing high pedestrian accident locations, consider the presence of nearby transit stops and opportunities for pedestrians to safely cross the street. At-grade midblock pedestrian crossings are effective at transit stop locations on roadways with lower vehicular volumes.

Pedestrian grade separations are appropriate at midblock locations when vehicular traffic volumes prohibit pedestrian crossings at grade. (See Figure 1025-5 for recommendations for marked crosswalks at unsignalized intersections.)

(7) School Bus Stops

School bus stops are typically adjacent to sidewalks in urban areas and along shoulders in rural areas. Determine the number of children using the stop and provide a waiting area that allows the children to wait safely for the bus. Children, because of their smaller size, might be difficult for motorists to see at crossings or stops. Determine whether utility poles, vegetation, and other roadside features interfere with the motorist’s ability to see the children. When necessary, relocate the obstructions or move the bus stop. Parked vehicles can also block visibility and parking prohibitions might be necessary near the bus stop.

(8) Illumination and Signing

In Washington State, the highest number of collisions between vehicles and pedestrians occur during November through February, when there is poor visibility and fewer daylight hours. Illumination of pedestrian crossings and other walkways is an important design consideration, because lighting has a major impact on a pedestrian’s safety and sense of security. Illumination provided solely for vehicular traffic is not always effective in lighting parallel walkways for pedestrians. Consider pedestrian-level lighting (mounted at a lower level) for walkways, intersections, and other pedestrian crossing areas with high nighttime pedestrian activity such as shopping districts, transit stops, schools, community centers, and other major pedestrian generators or areas with a history of pedestrian accidents. Design guidance for illumination is in Chapter 840. (See Chapter 820 and the MUTCD for pedestrian-related signing.)

(9) Work Zone Pedestrian Considerations

Providing access and mobility for pedestrians through and around work zones is an important design concern. In work zones, consider:

- Separating pedestrians from conflicts with work zone equipment and operations.
- Separating pedestrians from traffic moving through or around the work zone.
- Providing pedestrians with a safe, accessible, and convenient travel path that duplicates, as closely as possible, the characteristics of sidewalks or footpaths.

Ensure that walkways are clearly marked, pedestrian barriers are continuous, nonbendable, and detectable to persons with impaired vision using a cane, keep the pedestrian head space clear. Keep walkways free from pedestrian hazards such as holes, debris, and abrupt changes in grade or terrain. Keep wheelchair access along sidewalks clear of construction traffic control signs.

Temporary pedestrian facilities within the work zone shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

Consider the use of flaggers if pedestrian generators such as schools are in the work zone vicinity.

Provide advance notification of sidewalk closures.

Where transit stops are affected or relocated because of work activity, access to temporary transit stops shall be provided.

For further information or guidance on work zone pedestrian considerations, see the MUTCD.)

1025.06 Documentation

A list of documents that are required to be preserved in the Design Documentation Package (DDP) or the Project File (PF) can be found on the following web site:

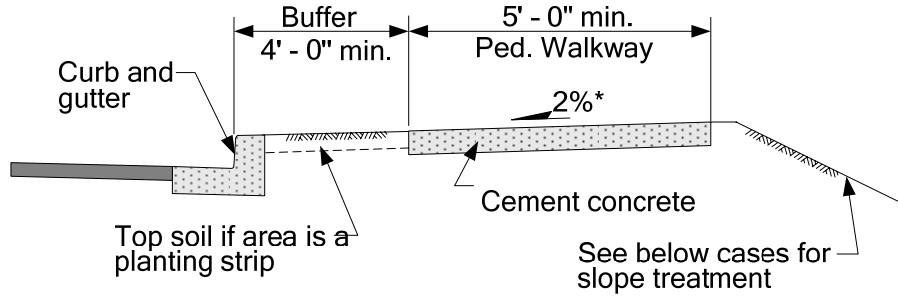
<http://www.wsdot.wa.gov/eesc/design/projectdev/>

Item	ADA Standards for Improvement Projects (New, Reconstruction, or Modification)	ADA Minimums for Evaluating Existing Facilities on Preservation Projects (Resurfacing or Paving)
Sidewalk Ramps		
Truncated Domes	Bottom 2 feet of ramp	Bottom 2 feet of ramp
Contrasting Colors	Yes	Yes
Landings ¹	48 inches square Min. ²	36 inches Min. ²
Longitudinal Slopes	12H:1V (8%)	8H:1V ³
Cross Slopes	48H:1V (2%)	Minimum feasible
Width	48 inches ²	36 inches ²
Flare Side Slopes	10H:1V ⁴	10H:1V
Accessible Routes		
Width	48 inches ⁵	36 inches
Longitudinal Slopes	20H:1V (5%) ^{6,7}	20H:1V(5%) ^{6,7}
Cross Slopes	48H:1V (2%)	Minimum feasible
Ramps^{8, 9}		
Landings ¹⁰ (Length)	60 inches ²	60 inches ²
Longitudinal Slopes	12H:1V (8%) ⁶	8H:1V ³
Cross Slopes	48H:1V (2%)	Minimum feasible
Width	44 inches	36 inches
Max. Rise Btw. Landings	30 inches	30 inches

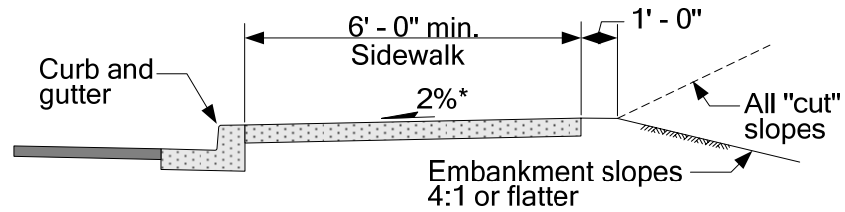
Notes:

1. The slope of the gutter pan or roadway surface at the bottom of ramp cannot exceed 20H: 1V.
2. The width of the landing shall not be less than the ramp width. Provide a 60 inch x 60 inch landing when a change of direction is required at the landing.
3. 10H:1V to 12H:1V is allowed for rises up to 6 inches; 8H:1V to 10H:1V is allowed for rises up to 3 inches.
4. Exception: Where the width of the walking surface at the top of the ramp and parallel to the run is less than 48 inches, the maximum side slope shall be 12H:1V.
5. If the width is less than 60 inches, passing spaces at least 60 inches x 60 inches shall be provided at intervals not to exceed 200 feet.
6. If accessible route is adjacent to a roadway, then the slope is allowed to match the profile of the road.
7. Slopes exceeding 5% must meet the requirements for ramps when accessible route is on a separate alignment and does not abut a roadway.
8. A ramp in this context is on a walkway on a separate alignment and does not abut a roadway. These ramps have slopes greater than 20H:1V.
9. Ramps shall have handrails, with the exception of curb ramps.
10. Landings required at top and bottom of ramp.

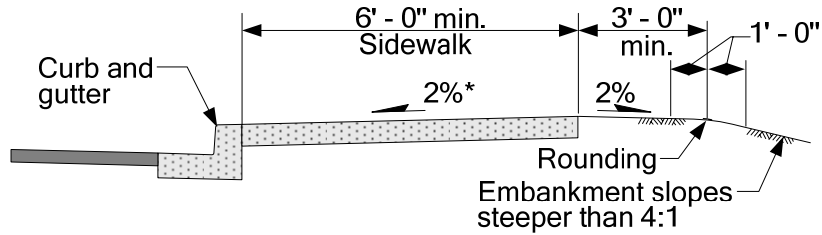
ADA Requirements
Figure 1025-2



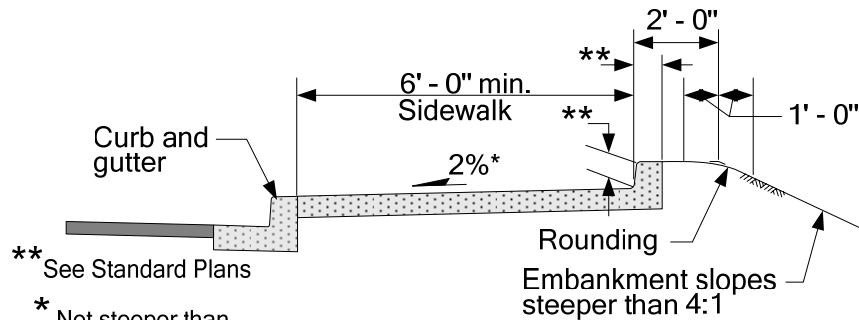
Case A



Case B

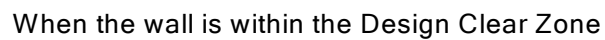
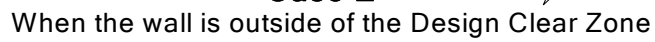


Case C



Case D

Pedestrian Walkways
Figure 1025-3a



Design Manual M 21-01
May 2006

Roadway Classification & Land Use Designation	Sidewalk Recommendations
Rural highways (outside urban growth areas)	No sidewalk recommended. 4-foot-wide shoulders adequate.
Suburban highways (one or less dwelling unit per acre)	Sidewalk on one side desirable. 4-foot-wide shoulders adequate.
Suburban highway (two to four dwelling units per acre)	Sidewalks on both sides of roadway desirable. Sidewalk on one side recommended.
Major arterial in residential area	Sidewalks on both sides of roadway recommended.
Collector or minor arterial in residential area	Sidewalks on both sides of roadway recommended.
Local street in residential area with less than one dwelling unit per acre	Sidewalk on one side desirable. 4-foot- wide shoulders adequate.
Local street in residential area with one to four dwelling units per acre	Sidewalks on both sides of roadway desirable. Sidewalk on one side recommended.
Local street in residential area with more than four dwelling units per acre	Sidewalks on both sides of roadway recommended.
Streets in commercial area	Sidewalks on both sides of roadway recommended.
Streets in industrial area	Sidewalks on both sides of roadway desirable. Sidewalk on one side recommended.

Sidewalk Recommendations
Figure 1025-4

Traffic Volume(ADT)	Posted Speed	Roadway Type			
		2 lanes	2 lanes, raised median ^a	4 lanes, raised median ^{a,g}	6 lanes, raised median ^{a,g}
Less than or equal to 9,000	30 mph and slower	Marked crosswalk	Marked crosswalk	Additional enhancement	
	35 mph to 40 mph	Marked crosswalk	Marked crosswalk	Additional enhancement	
	45 mph and higher	Additional enhancement	Additional enhancement	Active enhancement	
9,000 to 15,000	30 mph and slower	Marked crosswalk	Marked crosswalk	Additional enhancement	
	35 mph to 40 mph	Marked crosswalk	Marked crosswalk	Additional enhancement	
	45 mph and higher	Additional enhancement	Additional enhancement	Active enhancement	
15,000 to 30,000	30 mph and slower	Additional ^b enhancement	Additional enhancement	Additional ^b enhancement	Active ^d enhancement
	35 mph to 40 mph	Additional ^b enhancement	Additional enhancement	Active enhancement	Active ^d enhancement
	45 mph and higher	Active ^e enhancement	Active enhancement	See note 'C'.	See note 'C'.
Greater than 30,000	45 mph and lower	Active ^e enhancement	Active enhancement	Pedestrian ^f traffic signal	Pedestrian ^f traffic signal

* Inside city limits where the population exceeds 22,500, the decision to mark crosswalks resides with the city, subject to approval by WSDOT of the installation and type.

Notes:

- a Raised refuge island, minimum 4 feet wide and 6 feet long. A TWLTL is not considered a median.
- b Consider active enhancement treatment for roadways exceeding 20,000 ADT.
- c Provide alternate routes for pedestrian crossings or construct a grade-separated facility.
- d Location may be approaching the need for a controlled crossing. A pedestrian signal may be appropriate, based on engineering analysis.
- e Raised refuge island required.
- f Refer to region's Traffic Engineer for approval and design of a pedestrian traffic signal.
- g Facilities with four or more lanes that meet the crossing warrants require a raised median.

Minimum Requirements (additive for each level)

"marked crosswalk"

- * Marked and signed in accordance w/MUTCD Section 3B.17 & 2C.41 (signed @ crossing only)
- * Pedestrian-view warning signs
- * Illumination

"additional enhancement"

- * Minimum requirements listed under "marked crosswalk"
- * Stop line in accordance w/MUTCD Section 3B.16
- * Advance signing in accordance w/MUTCD Section 2C.41

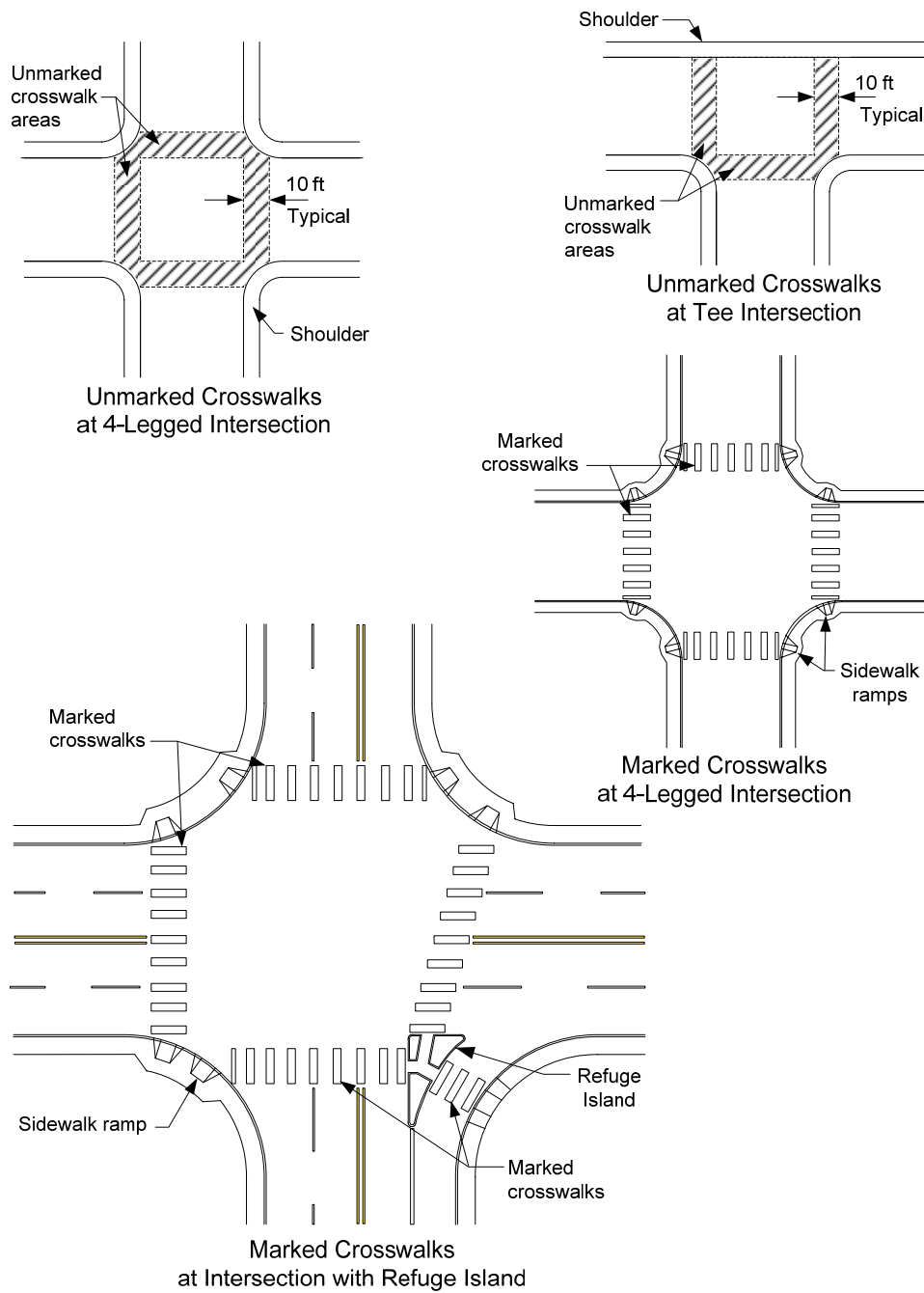
"active enhancement"

- * Minimum requirements listed under "additional enhancement"
- * Pedestrian-actuated warning beacons; overhead for roadway w/4 or more lanes

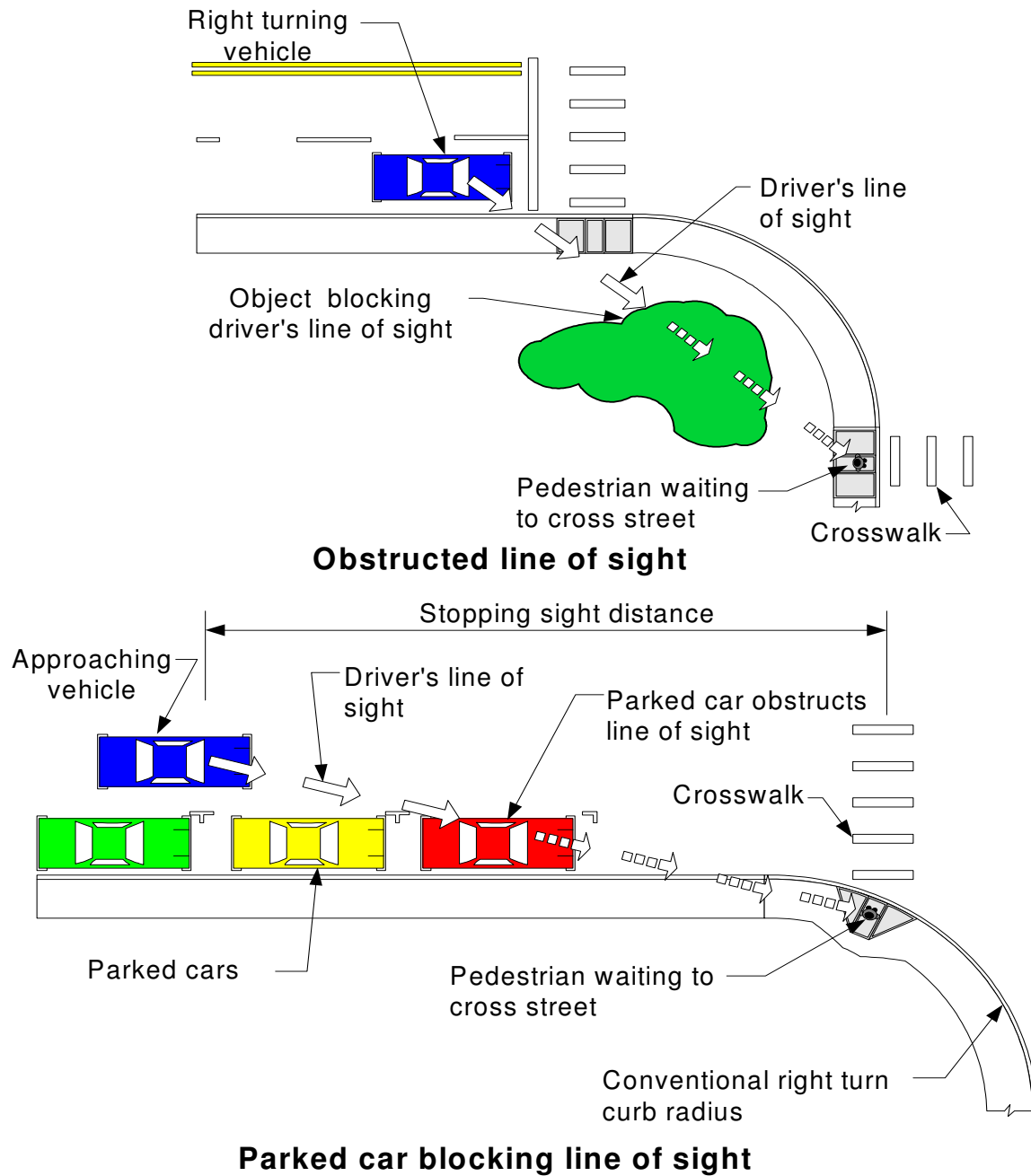
Note: For additional considerations that may be appropriate based on a site-specific engineering analysis, see *Design Manual*, 1025.05(3).

Marked Crosswalk Recommendations at Unsignalized Crossings

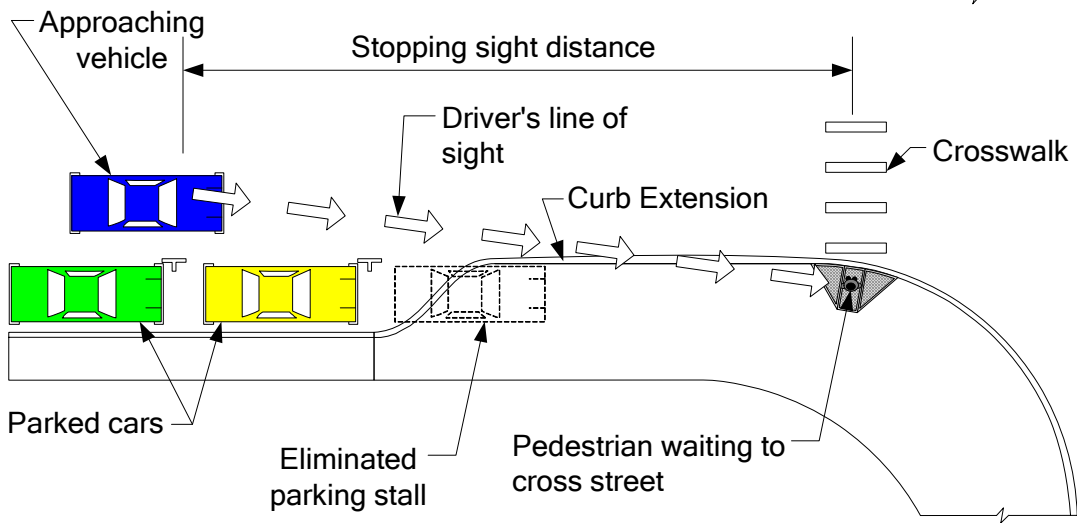
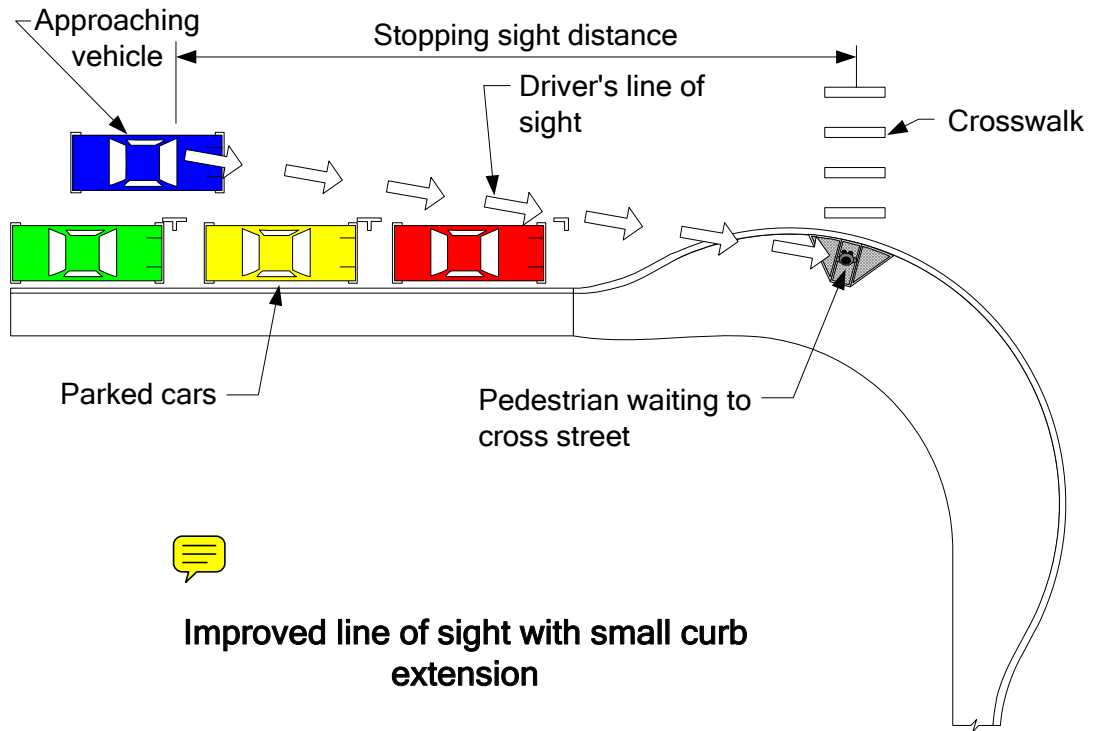
Figure 1025-5



Crosswalk Locations
Figure 1025-6



Sight Distance at Intersections
Figure 1025-7a



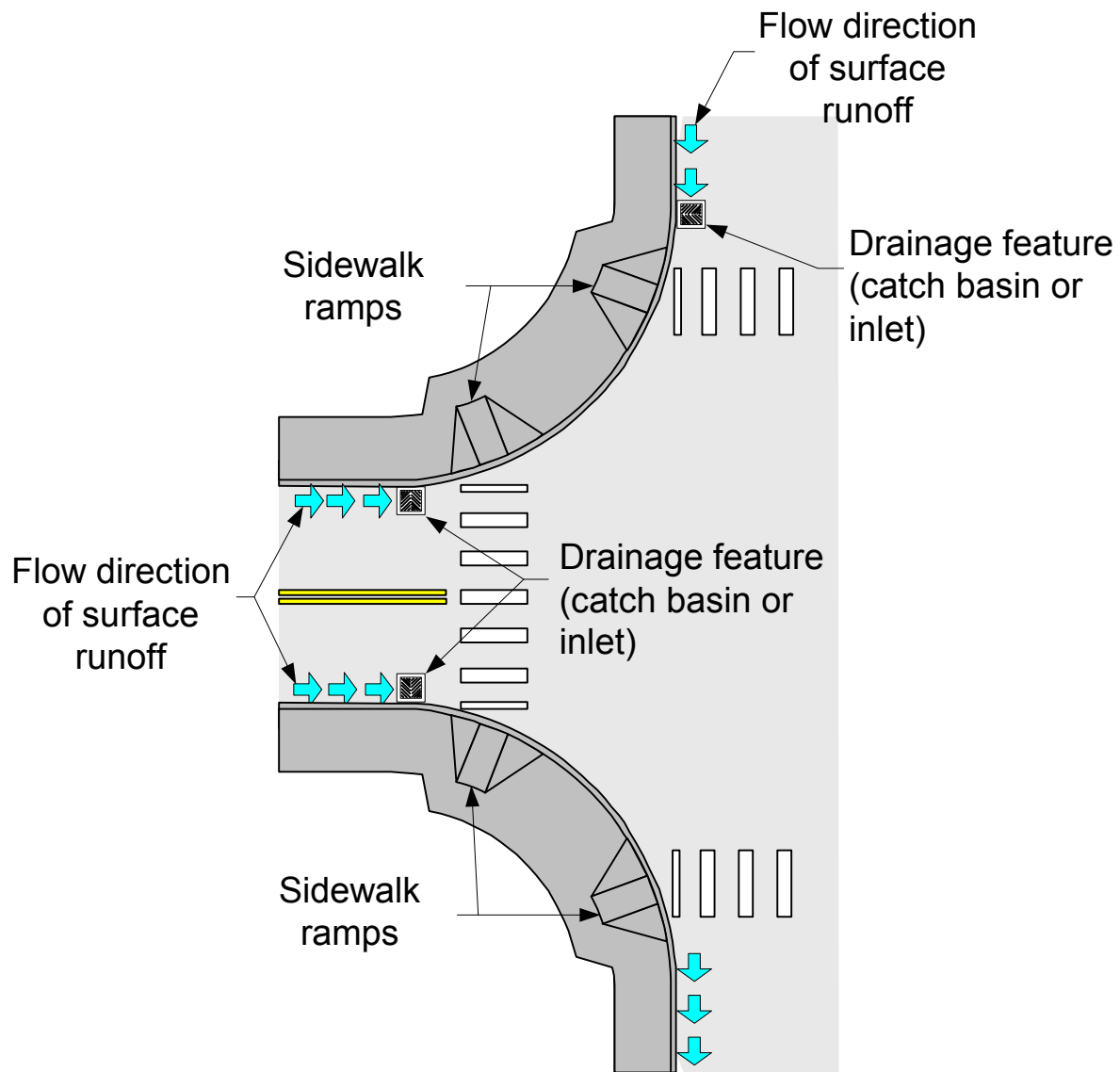
Sight Distance at Intersections
Figure 1025-7b



Curb Extension
Figure 1025-8



Midblock Pedestrian Crossing
Figure 1025-9



Sidewalk Ramp Drainage
Figure 1025-10