



7. UNIVERSAL PEDESTRIAN ACCESS

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Credit: Kimley-Horn and Associates, Inc.



INTRODUCTION

Nowhere is the concept of universal access more important than in the design of the pedestrian environment. While perhaps not intuitively obvious at first glance, this is the realm of streets with the greatest variation in user capabilities, and thus the realm where attention to design detail is essential to effectively balance user needs. This is also the realm where signs and street furniture are located, and where transitions are made between modes (e.g., driver or passenger to pedestrian via parking, bus stop/train station, or bike rack). The pedestrian environment includes sidewalks, curb ramps, crosswalks, bus stops, signs, and street furniture.

Without design guidelines, sidewalks are often too narrow, utility poles obstruct travel, steep driveway ramps are impassable to wheelchair users, and bus stops become blocked by the disorderly placement of shelters, poles, trash receptacles, and bike racks.



Sidewalks constructed without adequate design guidelines (Credit: Kimley-Horn and Associates, Inc.)



With well-defined guidelines, sidewalks are built to accommodate pedestrians of all ages and physical abilities, and become inviting pedestrian environments as the adjacent picture shows.

Designing the pedestrian realm for universal access enables persons with disabilities to live independently and lead full, enriched lives; they are able to go to work and to school, to shop, and otherwise engage in normal activities. Moreover, walking environments that accommodate people with disabilities improve walking conditions for everyone. People with strollers and rolling suitcases can make their way about with ease. Children can mature by learning to navigate through their neighborhoods with independence. Inaccessible pedestrian networks, on the other hand, can lead to people becoming housebound and socially isolated, which in turn can lead to a decline in well-being and a host of associated negative health outcomes such as depression.



*Wheelchair users need accessible sidewalks
(Credit: Dan Burden)*

This chapter describes the legal framework for accessible design of streets and sidewalks, various users of streets and sidewalks and their needs, and important elements of pedestrian facility design. The chapter ends with sidewalk design guidelines for a number of street classifications.

ESSENTIAL PRINCIPLES OF UNIVERSAL PEDESTRIAN ACCESS

The following design principles inform the recommendations made in this chapter and should be incorporated into every pedestrian improvement:

- The walking environment should be safe, inviting, and accessible to people of all ages and physical abilities.
- The walking environment should be easy to use and understand.
- The walking environment should seamlessly connect people to places. It should be continuous, with complete sidewalks, well-designed curb ramps, and well-designed street crossings

LEGAL FRAMEWORK

Under Title II of the Americans with Disabilities Act (ADA) of 1990, state and local governments and public transit authorities must ensure that all of their programs, services, and activities are



accessible to and usable by individuals with disabilities. They must ensure that new construction and altered facilities are designed and constructed to be accessible to persons with disabilities. State and local governments must also keep the accessible features of facilities in operable working condition through maintenance measures including sidewalk repair, landscape trimming, work zone accessibility, and snow removal.

Under the ADA, the U.S. Access Board is responsible for developing the minimum accessibility guidelines needed to measure compliance with ADA obligations when new construction and alterations projects are planned and engineered. These guidelines for public rights-of-way are found in draft form in the Public Rights-of-Way Accessibility Guidelines (draft PROWAG). The U.S. Department of Transportation has recognized this document as current best practices in pedestrian design and has indicated its intent to adopt the final PROWAG.

In addition to the PROWAG guidelines, Title II of the ADA also requires states and localities to develop ADA Transition Plans that remove barriers to disabled travel.



Obstructions can make passage difficult or impossible for wheelchair users. (Credit: Michael Ronkin)

These plans must

- Inventory physical obstacles and their location
- Provide adequate opportunity for residents with disabilities to provide input into the Transition Plan
- Describe in detail the methods the entity will use to make the facilities accessible
- Provide a yearly schedule for making modifications
- Name an official/position responsible for implementing the Transition Plan
- Set aside a budget to implement the Transition Plan



Missing curb cut ramp at crosswalk (Credit: Kimley-Horn and Associates, Inc.)



ADA Transition Plans are intended to ensure that existing inaccessible facilities are not neglected indefinitely and that the community has a detailed plan in place to provide a continuous pedestrian environment for all residents.

USERS AND NEEDS

To fully accommodate everybody, designers must consider the widely varying needs and capabilities of the people in the community. People walk at different speeds. Some are able to endure long treks, while others can only go short distances. Some use wheelchairs and are particularly sensitive to uneven pavement and surface materials. Others have limited sight and rely on a cane. People's strengths, sizes, and judgmental capabilities differ significantly. The needs of one group of users may be at odds with those of another group of users. For instance, gradual ramps and smooth transitions to the street help people in wheelchairs, but present challenges for the sight-impaired when they can't easily find the end of the sidewalk and beginning of the street.

"Not friendly to the disabled. There are a few talking or beeping street lights but they break frequently and the street crossings are made for the driver's wellbeing, not the person walking."

- Broward Complete Streets survey respondent

The text below identifies the unique constraints individuals with different types of disabilities and limitations face as pedestrians. Understanding their needs will help ensure more universal design of the sidewalk network.

PEOPLE WITH MOBILITY IMPAIRMENTS

People with mobility impairments range from those who use assistive devices, such as wheelchairs, crutches, canes, orthotics, and prosthetic devices, to those who use no such devices but face constraints walking long distances on non-level surfaces or on steep grades.

Wheelchair and scooter users are most affected by the following:

- Uneven surfaces that hinder movement
- Rough surfaces that make rolling difficult and can cause pain, especially for people with back injuries
- Steep uphill slopes that slow the user
- Steep downhill slopes that cause a loss of control



Steep cross slopes create difficulties for wheelchair users.

(Credit: Michael Ronkin)



- Cross slopes that make the assistive device unstable
- Narrow sidewalks that impede the ability of users to turn or to cross paths with others
- Devices that are hard to reach, such as push buttons for walk signals and doors
- The lack of time to cross the street

Walking-aid users are most affected by the following:

- Steep uphill slopes that make movement slow or impossible
- Steep downhill slopes that are difficult to negotiate
- Cross slopes that cause the walker to lose stability
- Uneven surfaces that cause these users to trip or lose balance
- Long distances
- Situations that require fast reaction time
- The lack of time to cross the street



*Walking-aid users need clear sidewalks.
(Credit: Dan Burden)*

Prosthesis users often move slowly and have difficulty with steep grades or cross slopes.

PEOPLE WITH VISUAL IMPAIRMENTS

People with visual impairments include those who are partially or fully blind, as well as those who are colorblind. Visually impaired people face the following difficulties:

- Limited or no visual perception of the path ahead
- Limited or no visual information about their surroundings, especially in a new place
- Changing environments where they rely on memory
- Lack of non-visual information
- Inability to react quickly
- Unpredictable situations, such as complex intersections that are not at 90 degrees
- Inability to distinguish the edge of the sidewalk from the street
- Compromised ability to detect the proper time to cross a street
- Compromised ability to cross a street along the correct path
- Need for more time to cross the street



*Sight-impaired pedestrians need additional sensory cues.
(Credit: Dan Burden)*



PEOPLE WITH COGNITIVE IMPAIRMENTS

People with cognitive impairments encounter difficulties in thinking, learning, and responding, and in performing coordinated motor skills. Cognitive disabilities can cause some to become lost or have difficulty finding their way. They may also not understand standard street signs and traffic signals. Some may not be able to read and benefit from signs with symbols and colors.

CHILDREN AND OLDER ADULTS

Children and many older adults don't fall under specific categories for disabilities, but must be taken into account in pedestrian planning. Children are less mentally and physically developed than adults and have the following characteristics:

- Less peripheral vision
- Limited ability to judge speed and distance
- Difficulty locating sounds
- Limited or no reading ability so don't understand text signs
- Occasional impulsive or unpredictable behavior
- Little familiarity with traffic
- Difficulty in carrying packages

Small children are also more difficult to see than adults.

The natural aging process generally results in at least some decline in sensory and physical capability. As a result, many older adults experience the following:

- Declining vision, especially at night
- Decreased ability to hear sounds and detect where they come from
- Less strength to walk up hills and less endurance overall
- Reduced balance, especially on uneven or sloped sidewalks
- Slowed reaction times to dangerous situations
- Slowed walking speed
- Increased fragility and frailty: their bodies are more likely to be seriously injured in a fall or vehicular crash and their recovery becomes longer and more tenuous. This makes older pedestrians the most vulnerable pedestrians.



*Vulnerable users crossing street
(Credit: Dan Burden)*



PEDESTRIAN FACILITY DESIGN

To provide a seamless path of travel throughout the community that is accessible to all, designers should consider five important elements: sidewalks, curb ramps, crosswalks, signals, and bus stops.

SIDEWALKS

Sidewalks should provide a comfortable space for pedestrians between the roadway and adjacent land uses. Sidewalks along city streets are the most important component of pedestrian mobility. They provide access to destinations and critical connections between modes of travel, including automobiles, transit, and bicycles. General provisions for sidewalks include pathway width, slope, space for street furniture, utilities, trees and landscaping, and building ingress/egress.

Sidewalks include four distinct zones: the frontage zone, the pedestrian (aka walking) zone, the furniture zone, and the curb zone. The minimum widths of each of these zones vary based on street classifications as well as land uses. The Street Classifications section in this chapter describes these recommendations in more detail as applied to individual local jurisdictions. The table at the end of this chapter recommends minimum widths for each zone for different street types and land uses.

Frontage Zone

The frontage zone is the portion of the sidewalk located immediately adjacent to buildings, and provides shy distance from buildings, walls, fences, or property lines. It includes space for building-related features such as entryways and accessible ramps. It can include landscaping as well as awnings, signs, news racks, benches, and outdoor café seating. In single family residential neighborhoods, landscaping typically occupies the frontage zone.

Pedestrian Zone

The pedestrian zone, situated between the frontage zone and the furniture zone, is the area dedicated to walking and should be kept clear of all fixtures and obstructions. Within the pedestrian zone, the Pedestrian Access Route (PAR) is the path that provides continuous connections from the public right-of-way to building and property entry points, parking areas, and public transportation. This pathway is required to comply with ADA guidelines and is intended to be a seamless pathway for wheelchair and white cane users. As such, this route should be firm, stable, and slip-resistant, and should comply with maximum cross slope requirements (2 percent grade). The walkway grade shall not exceed the general grade of the adjacent street. Aesthetic textured pavement materials (e.g., brick and pavers) are best used in the frontage and furniture zones, rather than the PAR. The PAR should be a minimum of 4 feet, but preferably at least 5 feet in width to provide adequate space for two pedestrians to



comfortably pass or walk side by side. All transitions (e.g., from street to ramp or ramp to landing) must be flush and free of changes in level. The engineer should determine the pedestrian zone width to accommodate the projected volume of users. In no case will this zone be less than the width of the PAR.

Non-compliant driveways often present significant obstacles to wheelchair users. The cross slope on these driveways is often much steeper than the 2 percent maximum grade. Driveway aprons that extend into the pedestrian zone can render a sidewalk impassable to users of wheelchairs, walkers, and crutches. They need a flat plane on which to rest all four supports (two in the case of crutches). To provide a continuous PAR across driveways, aprons should be confined to the furniture and curb zones.

Furniture Zone

The furniture zone is located between the curb line and the pedestrian zone. The furniture zone should contain all fixtures, such as street trees, bus stops and shelters, parking meters, utility poles and boxes, lamp posts, signs, bike racks, news racks, benches, waste receptacles, drinking fountains, and other street furniture to keep the pedestrian zone free of obstructions. In residential neighborhoods, the furniture zone is often landscaped. Resting areas with benches and space for wheelchairs should be provided in high volume pedestrian districts and along blocks with a steep grade to provide a place to rest for older adults, wheelchair users, and others who need to catch their breath.

Curb Zone

The curb zone serves primarily to prevent water and cars from encroaching on the sidewalk. It defines where the area for pedestrians begins, and the area for cars ends. It is the area people using assistive devices must traverse to get from the street to the sidewalk, so its design is critical to accessibility.

Other Sidewalk Guidelines

- Landscaped buffers or fences should separate sidewalks from off-street parking lots or off-street passenger loading areas.
- Pedestrian and driver sight distances should be maintained near driveways. Fencing and foliage near the intersection of sidewalks and driveways should ensure adequate sight distance as vehicles enter or exit.
- Where no frontage zone exists, driveway ramps usually violate cross slope requirements. In these situations, sidewalks should be built back from the curb at the driveway as shown in the adjacent photo.



Routing sidewalks around driveway ramps maintains a flush surface. (Credit: Dan Burden)

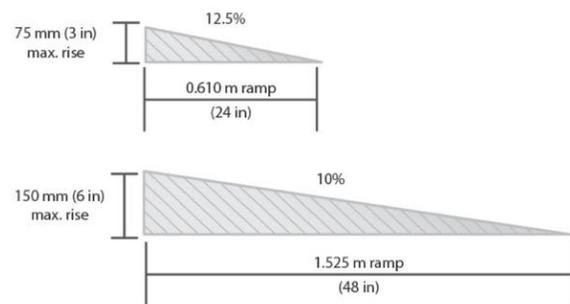
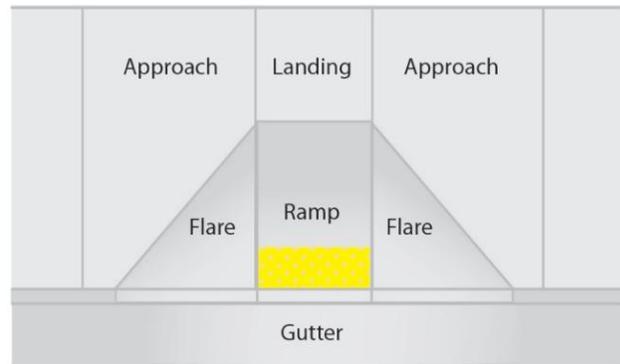


CURB RAMPS

Proper curb ramp design is essential to enable pedestrians using assistive mobility devices (e.g., scooters, walkers, and crutches) to transition between the street and the sidewalk. These design guidelines provide a basic overview of curb ramp design. The ADA requires installation of curb ramps in new sidewalks and whenever an alteration is made to an existing sidewalk or street. Roadway resurfacing is considered an alteration and triggers the requirement for curb ramp installations or retrofits to current standards. Curb ramps are typically installed at intersections, mid-block crossings (including trail connections), accessible on-street parking, and passenger loading zones and bus stops.

The following define the curb ramp components along with minimum dimensions:

- Landing – the level area at the top of a curb ramp facing the ramp path. Landings allow wheelchairs to enter and exit a curb ramp, as well as travel along the sidewalk without tipping or tilting. This landing must be the width of the ramp and measure at least 4 feet by 4 feet. There should also be a level (not exceeding a 2 percent grade) 4 foot by 4 foot bottom landing of clear space outside of vehicle travel lanes.
- Approach – the portion of the sidewalk on either side of the landing. Approaches provide space for wheelchairs to prepare to enter landings.
- Flare – the transition between the curb and sidewalk. Flares provide a sloped transition (10 percent maximum slope) between the sidewalk and curb ramp to help prevent pedestrians from tripping over an abrupt change in level. Flares can be replaced with curb where the furniture zone is landscaped.
- Ramp – the sloped transition between the sidewalk and street where the grade is constant and cross slope at a minimum. Curb ramps are the main pathway between the sidewalk and street.



*Curb ramp components,
and alternate ramp slopes
(Credit: Michele Weisbart)*



- Gutter – the trough that runs between the curb or curb ramp and the street. The slope parallel to the curb should not exceed 2 percent at the curb ramp.
- Detectable Warning – surface with distinct raised areas to alert pedestrians with visual impairments of the sidewalk-to-street transition.

There are several different types of curb ramps. Selection should be based on local conditions. The most common types are diagonal, perpendicular, parallel, and blended transition. PROWAG provides additional design guidance and curb ramp examples appropriate for a variety of contextual constraints.

Diagonal Curb Ramps

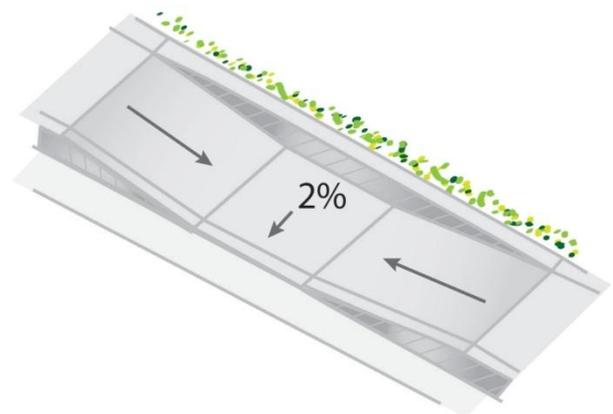
Diagonal curb ramps are single curb ramps at the apex of the corner. These have been commonly installed by many jurisdictions to address the requirements of the ADA, but have since been identified as a non-preferred design type as they introduce dangers to wheelchair users. Diagonal curb ramps send wheelchair users and people with strollers or carts toward the middle of the intersection and make the trip across longer.

Perpendicular Curb Ramps

Perpendicular curb ramps are placed at a 90-degree angle to the curb. They must include a level landing at the top to allow wheelchair users to turn 90 degrees to access the ramp, or to bypass the ramp if they are proceeding straight. Perpendicular ramps work best where there is a wide sidewalk, curb extension, or planter strip. Perpendicular curb ramps provide a direct, short trip across the intersection.

Parallel Curb Ramps

Parallel curb ramps are oriented parallel to the street; the sidewalk itself ramps down. They are used on narrow sidewalks where there isn't enough room to install perpendicular ramps. Parallel curb ramps require pedestrians who are continuing along the sidewalk to ramp down and up. Where space exists in a planting strip, parallel curb ramps can be designed in combination with perpendicular ramps to reduce the ramping for through pedestrians. Careful attention must be paid to the construction of the bottom landing to limit accumulation of water and/or debris.



*Parallel curb ramp
(Credit: Michele Weisbart)*

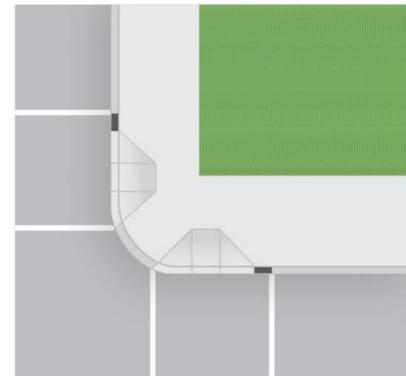


Curb Ramp Placement

For best practices in ramp placement, refer to Chapter 6, "Intersection Design."

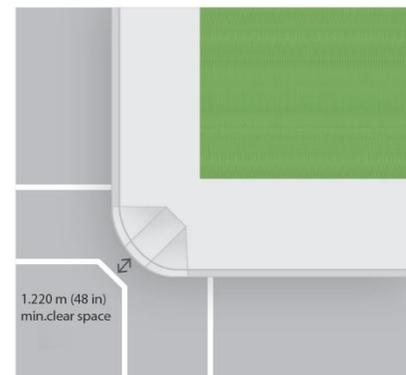
One ramp should be provided for each crosswalk, which usually translates to 2 per corner. This maximizes access by placing ramps in line with the sidewalk and crosswalk, and by reducing the distance required to cross the street, compared with a single ramp on the apex.

A single ramp at the apex requires users to take a longer, more circuitous travel path to the other side and causes users to travel towards the center of the intersection where they may be in danger of getting hit by turning cars; being in the intersection longer exposes the user to greater risk of being hit by vehicles. A single ramp at the apex should be avoided in new construction and may be used only for alterations where a design exception is granted because of existing utilities and other significant barriers. In all cases, reducing the curb radius makes ramp placement easier.



Blended Transitions

Blended transitions are situations where either the entire sidewalk has been brought down to the street or crosswalk level, or the street has been brought up to the sidewalk level. They work well on large radius corners where it is difficult to line up the crosswalks with the curb ramps, but have drawbacks. Children, persons with cognitive impairments, and guide dogs may not distinguish the street edge. Turning vehicles may also encroach onto the sidewalk. For these reasons, bollards, planting boxes, or other intermittent barriers should be installed to prevent cars from traveling on the sidewalk. Detectable warnings should also be placed at the edge of the sidewalk to alert pedestrians with visual impairments of the transition to the street. Municipalities should follow the standards and guidelines for curb ramps provided in Table 7.1.



*One ramp per crosswalk vs. single ramp at the apex
(Credit: Michele Weisbart)*



Table 7.1 Curb Ramp Design Standards and Guidelines

Curb Ramp Type	Characteristic	ADA Standards	PROWAG
Perpendicular	Maximum slope of ramps	8.33%	8.3%
	Maximum cross-slope of ramps	2%	2%
	Maximum slope of flared sides	10%	10%
	Minimum ramp width	36"	48"
	Minimum landing length	36"	48"
	Minimum landing width		48"
	Maximum gutter slope	5%	5%
	Changes in level	Flush	Flush
	Truncated domes	Full depth and width	24" min.
Diagonal (at apex)	Maximum slope of ramps	8.33%	Not allowed except in alterations
	Maximum cross-slope of ramps	2%	2%
	Maximum slope of flared sides	10%	2%
	Minimum ramp width	36"	48"
	Minimum landing length	36	48"
	Minimum landing width		48"
	Maximum gutter slope	5%	2%
	Changes in level	Flush	Flush
	Minimum clear space		48"
Parallel and combination	Maximum slope of ramps	8.33%	8.3%
	Maximum cross-slope of ramps	2%	2%
	Maximum slope of flared sides	10%	
	Minimum ramp width	36"	48"
	Minimum landing length	36"	
	Minimum landing width		48"
	Maximum landing slope		2%
	Maximum gutter slope	5%	5%
	Changes in level	Flush	Flush
Truncated domes	Full depth and width	24"	
Curb extensions and built-up	Maximum slope of ramps	8.33%	8.3%
	Maximum cross-slope of ramps	2%	2%
	Maximum slope of flared sides	10%	10%
	Minimum ramp width	36"	48"
	Minimum landing length	36"	48"
	Minimum landing width		48"
	Maximum gutter slope	5%	5%
	Changes in level	Flush	flush
	Detectable warnings	Full depth and width	24"



DETECTABLE WARNINGS

Because a curb ramp removes the curb that visually impaired persons use to identify the location of a street, a detectable warning surface must be placed at the back of the curb. This detectable strip should be as wide as the ramp and a minimum of 24 inches deep. One corner should be located at the back of the curb and the other corner may be up to 5 feet from the back of the curb. These strips are most effective when adjacent to smooth pavement so the difference is easily detected. Color contrast is needed so partially sighted people can see them.



*Required truncated domes
(Credit: Ryan Snyder)*

The ADAAG standards for detectable warnings are as follows.

- General: Detectable warnings shall consist of a surface of truncated domes and shall meet standards for size, spacing, contrast and edges
- Base diameter: 0.9 inches minimum; 1.4 inches maximum
- Top diameter: 50 percent of base diameter minimum to 65 percent maximum
- Height: 0.2 inches
- Center-to-center spacing: 1.6 inches minimum to 2.4 inches maximum
- Base-to-base spacing: 0.65 inches minimum
- Visual contrast: light on dark, or dark on light with adjacent walking surface
- Platform edges: 24 inches wide and shall extend the full public use area of the platform

PROWAG best practices include the following.

- Width: as wide as the ramp and 24 inches deep
- Location: one corner at back of the curb, the other corner up to 5 feet from back of curb
- Used at
 - The edge of depressed corners
 - The border of raised crosswalks and intersections
 - The base of curb ramps
 - The border of medians
 - The edge of transit platforms and where railroad tracks cross the sidewalk



SIGNALS

Signalized street crossings require special consideration of people with disabilities. The following text provides guidance to do that.

Crossing Times

In planning for people with disabilities, slower speeds must be considered. This is critical in setting the timing of the walk phase of signalized intersections. The Manual on Uniform Traffic Control Devices (MUTCD) requires that transportation agencies use an assumed walking speed of 3.5 feet/second for signal timing. In situations where a large number of older adults or persons with disabilities cross, this may be inadequate to meet their needs. Some local signal maintaining agencies instead use 2.8 feet/second.

Local jurisdictions may also use PUFFIN (Pedestrian-User-Friendly-Intelligent) traffic signals to ensure that all pedestrians have adequate time to cross. PUFFIN crossings use infrared monitors to detect the presence of pedestrians in the crosswalk, and will hold the signal red for cross traffic until the pedestrian has left the crosswalk. PUFFIN crossings help slower pedestrians, but also help the flow of traffic because they allow the normal pedestrian design speed to be set at a higher level.

Pedestrian-Activated Push Buttons

Pedestrian-activated traffic controls require pedestrians to push a button to activate a walk signal. As noted in Chapter 8, "Pedestrian Crossings," pedestrian-activated signals are generally discouraged. The "WALK" signal should automatically activate except under circumstances described in that chapter. Where pedestrian-activated traffic controls exist, they should be located as close as possible to curb ramps without reducing the width of the path. The buttons should be at a level that is easily reached by people in wheelchairs near the top of the ramp. The U.S. Access Board guidelines recommend buttons raised above or flush with their housing and large enough (a minimum of 2 inches) for people with visual impairments to see them. The buttons should also be easy to push.



Pedestrian push button placement (Credit: Michele Weisbart)

Accessible Pedestrian Signals (APS)

Wayfinding for pedestrians with visual impairments is significantly improved with the use of APS at signalized intersections. In fact, APS are the most commonly requested accommodation



under Section 504 of the Rehabilitation Act of 1973. APS communicate information about pedestrian timing in non-visual formats such as audible tones, verbal messages, and/or vibrating surfaces. Verbal messages provide the most informative guidance. These devices should be installed close to the departure location and on the side away from the center of the intersection. Since they are typically only audible 6 to 12 feet from the push button, 10 feet should separate two APS devices on a corner. If two accessible pedestrian pushbuttons are placed less than 10 feet apart or on the same pole, each accessible pedestrian pushbutton shall be provided with a pushbutton locator tone, a tactile arrow, a speech walk message for the WALKING PERSON (symbolizing WALK) indication, and a speech pushbutton information message. Volumes of the walk indication and push button locator tone shall automatically adjust in response to ambient sound.

LAND USE AND SIDEWALK DESIGN GUIDELINES

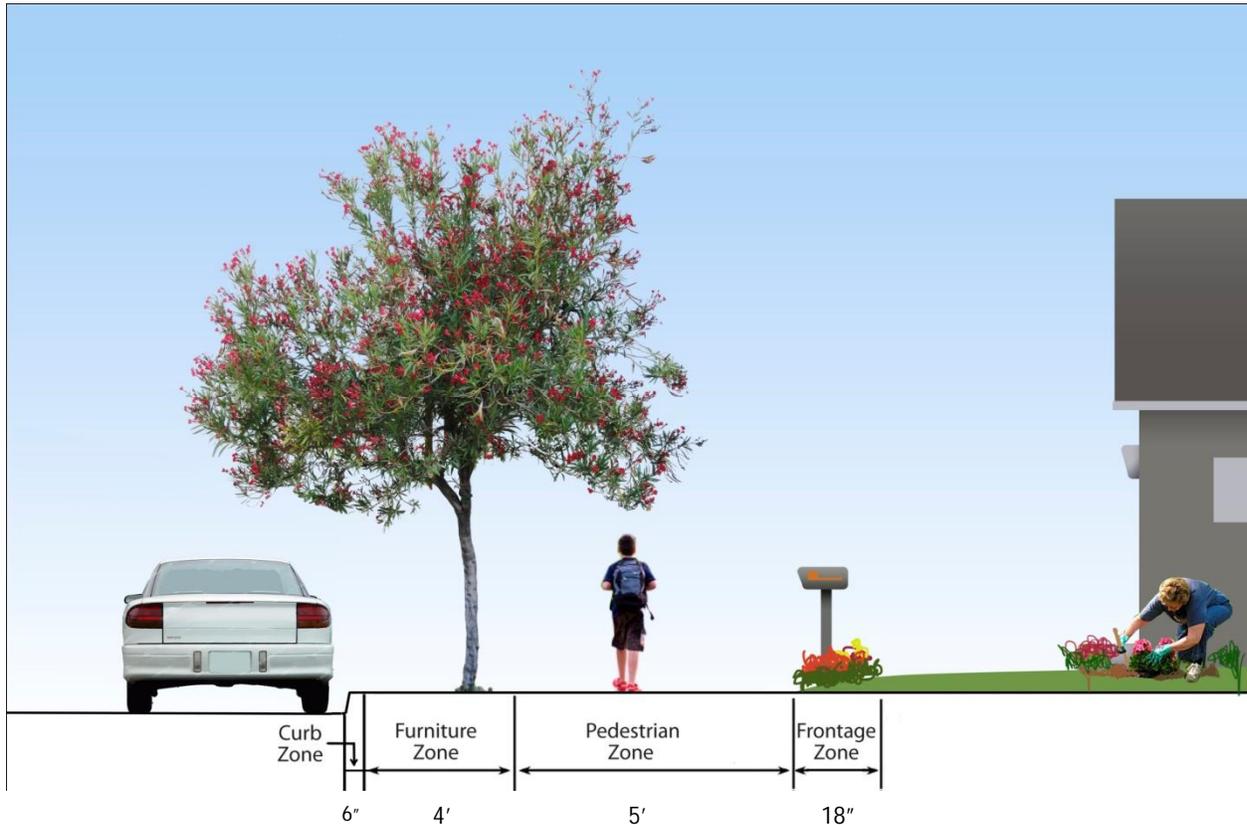
The sidewalk design guidelines in this chapter integrate design and land use to provide safe and convenient passage for pedestrians. Sidewalks should have adequate walking areas and provide comfortable buffers between pedestrians and traffic. These guidelines will ensure sidewalks in all development and redevelopment projects provide access for people of all ages and physical abilities.

Sidewalks will vary according to the type of street. A local street with residences will require different sidewalk dimensions than a boulevard with commercial establishments. The descriptions below indicate the type of pedestrian activity expected at each of the specified land uses. The graphics (credit Marty Bruinsma) illustrate the minimum widths of the sidewalk zones for each of the contexts. The matrix in the following section provides specific minimum requirements for the four sidewalk zones according to combinations of land use and street classifications.



LOW / MEDIUM DENSITY RESIDENTIAL

These streets are typically quieter than others and generally do not carry transit vehicles or high volumes of traffic. Pedestrians require a pleasant walking environment within these neighborhoods, as well as to access land uses and transit on nearby streets. Of the four sidewalk zones, the furniture zone is often the widest, to provide room for street trees.

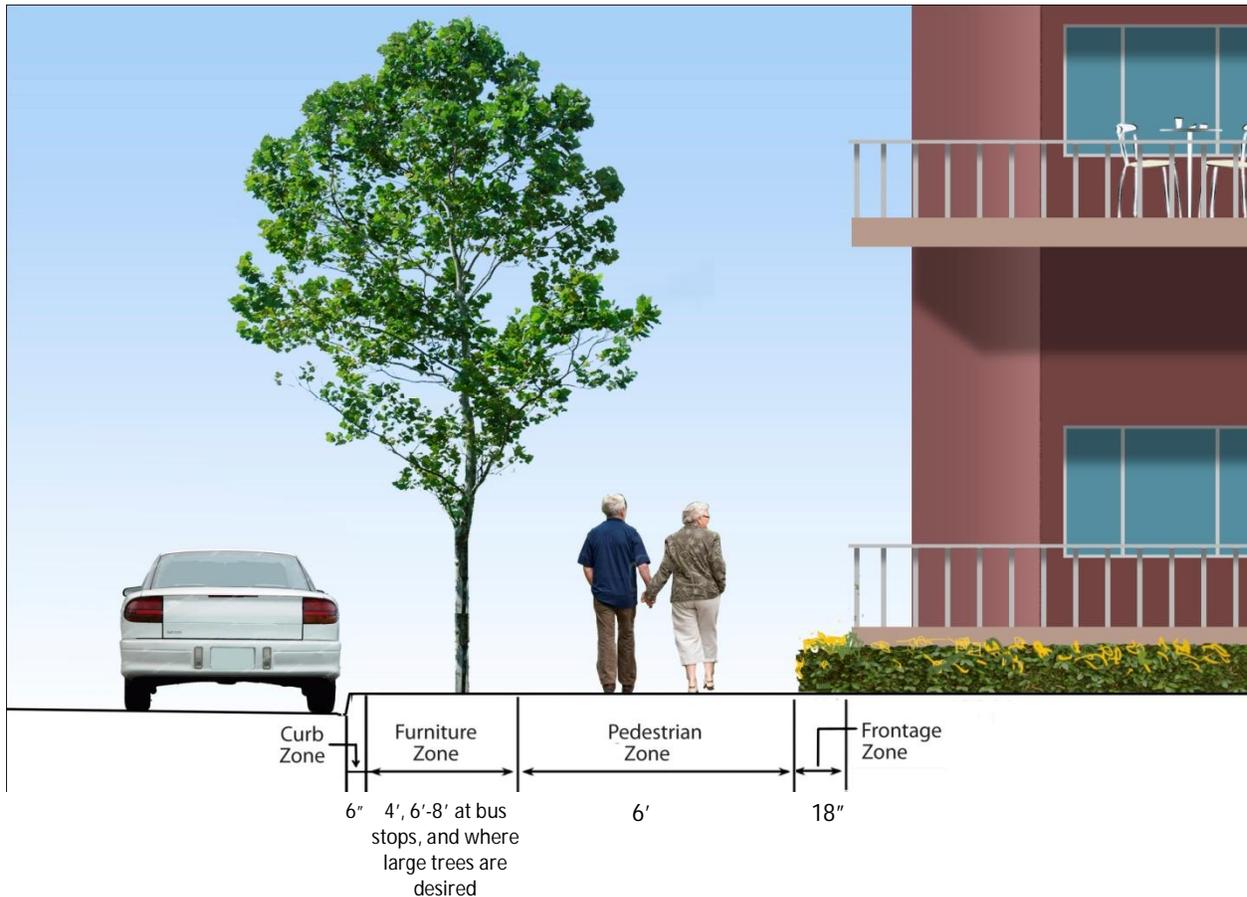


Please note that the dimensions shown above are only the minimum required dimensions. The pedestrian zone refers to the minimum clear width of usable sidewalk space for pedestrians, not necessarily the actual width of the sidewalk.



MEDIUM / HIGH DENSITY RESIDENTIAL

These streets support greater volumes of pedestrians. Streets with transit service require good pedestrian links to bus stops. The pedestrian zone should be wider than in low/medium density residential.



Please note that the dimensions shown above are only the minimum required dimensions. The pedestrian zone refers to the minimum clear width of usable sidewalk space for pedestrians, not necessarily the actual width of the sidewalk.

NEIGHBORHOOD COMMERCIAL

These streets often have grocers, laundromats, drug stores, and other neighborhood-serving retail establishments. Sidewalks in neighborhood commercial areas should accommodate pedestrians walking from residences to stores. Of the four sidewalk zones, the pedestrian zone should be the widest, with a generous frontage zone to provide room for features next to buildings such as newspaper boxes. These sidewalks should also be designed with the understanding that cars will cross sidewalks as they enter and exit commercial driveways.

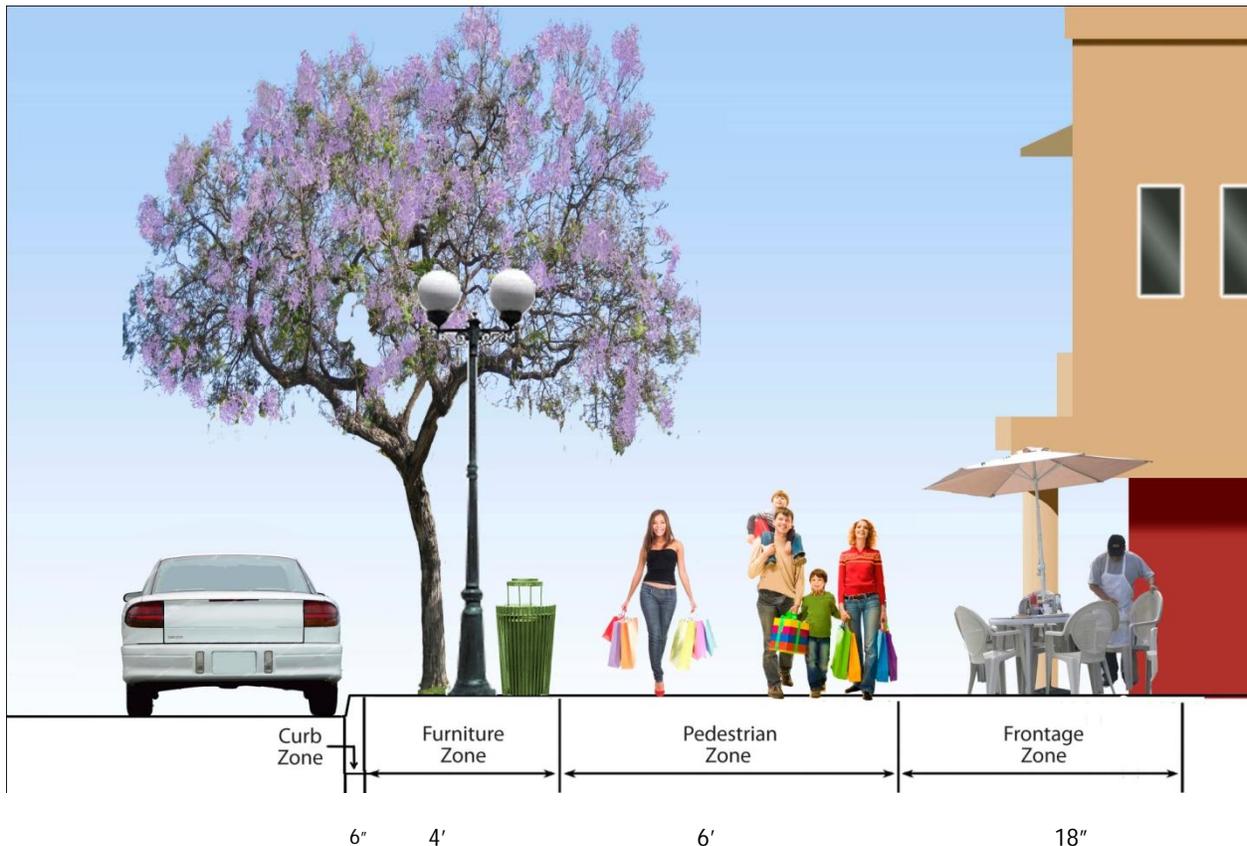


GENERAL / REGIONAL COMMERCIAL

These streets have retail, office, civic, and recreational uses concentrated along boulevards and avenues. Transit service runs along these streets and pedestrians need buffers from traffic. Of the four sidewalk zones, the pedestrian and furniture zones are favored. These sidewalks also should be designed with the understanding that a significant number of cars will cross sidewalks as they enter and exit commercial driveways.

MIXED / MULTI-USE

The sidewalks along these streets should support significant pedestrian volumes due to their integrated nature and higher densities. Of the four sidewalk zones, the pedestrian and frontage zones will be favored. Transit service runs along these streets and sidewalks will require buffers from traffic.



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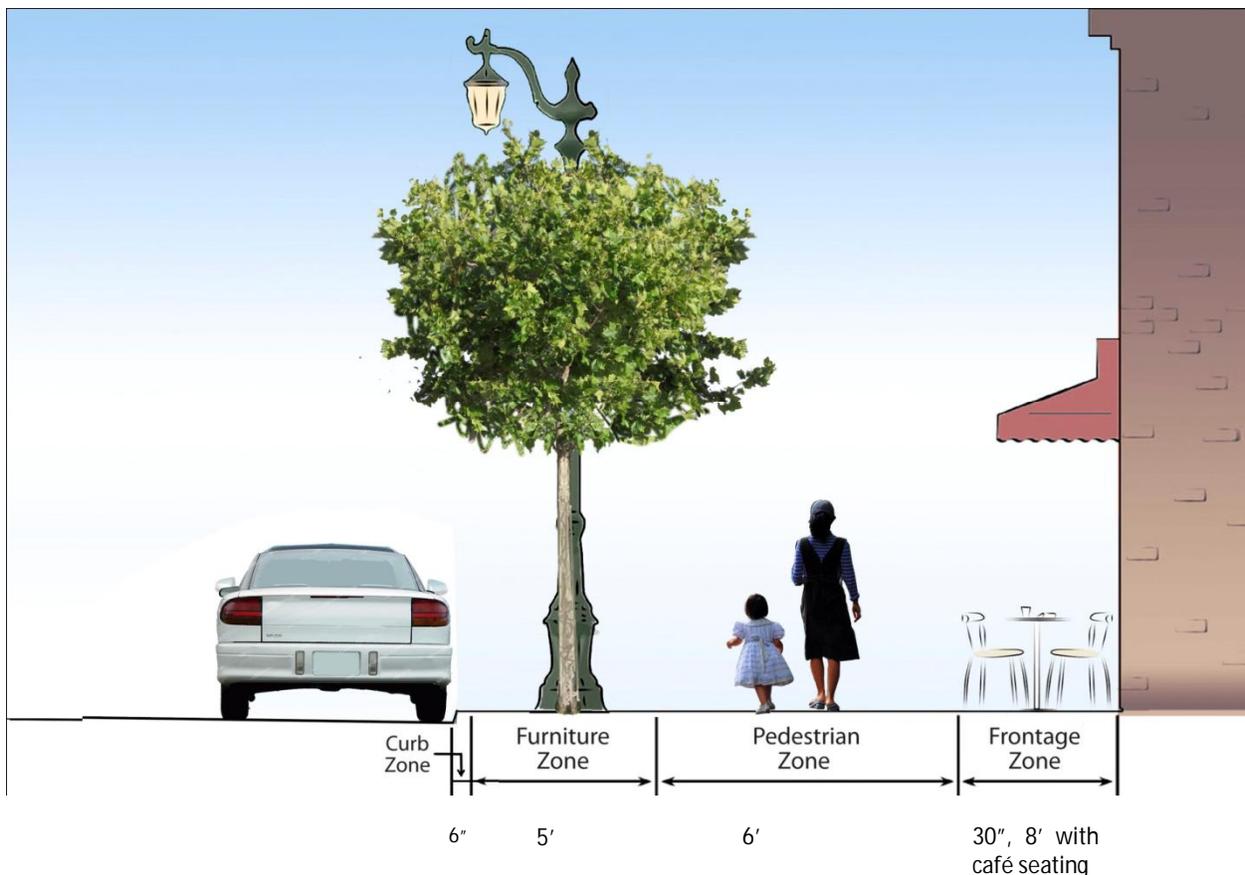


INDUSTRIAL

Industrial streets are zoned for manufacturing, office warehousing, and distribution. Pedestrian volumes are likely to be lower here given that these land uses typically employ fewer people per square foot than general commercial areas. Employees will need good sidewalks to get to work.

DOWNTOWN CORE/MAIN STREET

The downtown core or Main Street is a pedestrian-oriented area. This is where the greatest numbers of pedestrians are encouraged and expected. The downtown core serves as the retail, restaurant, and entertainment center of a community. This area will need the widest sidewalks, the widest crosswalks, the brightest street lighting, the most furnishings, and other features that will enhance the pedestrian environment. Of the four sidewalk zones, the pedestrian and frontage zones will be favored, with a furniture zone wide enough for street trees.



Please note that the dimensions shown above are only the minimum required dimensions. The pedestrian zone refers to the minimum clear width of usable sidewalk space for pedestrians, not necessarily the actual width of the sidewalk.

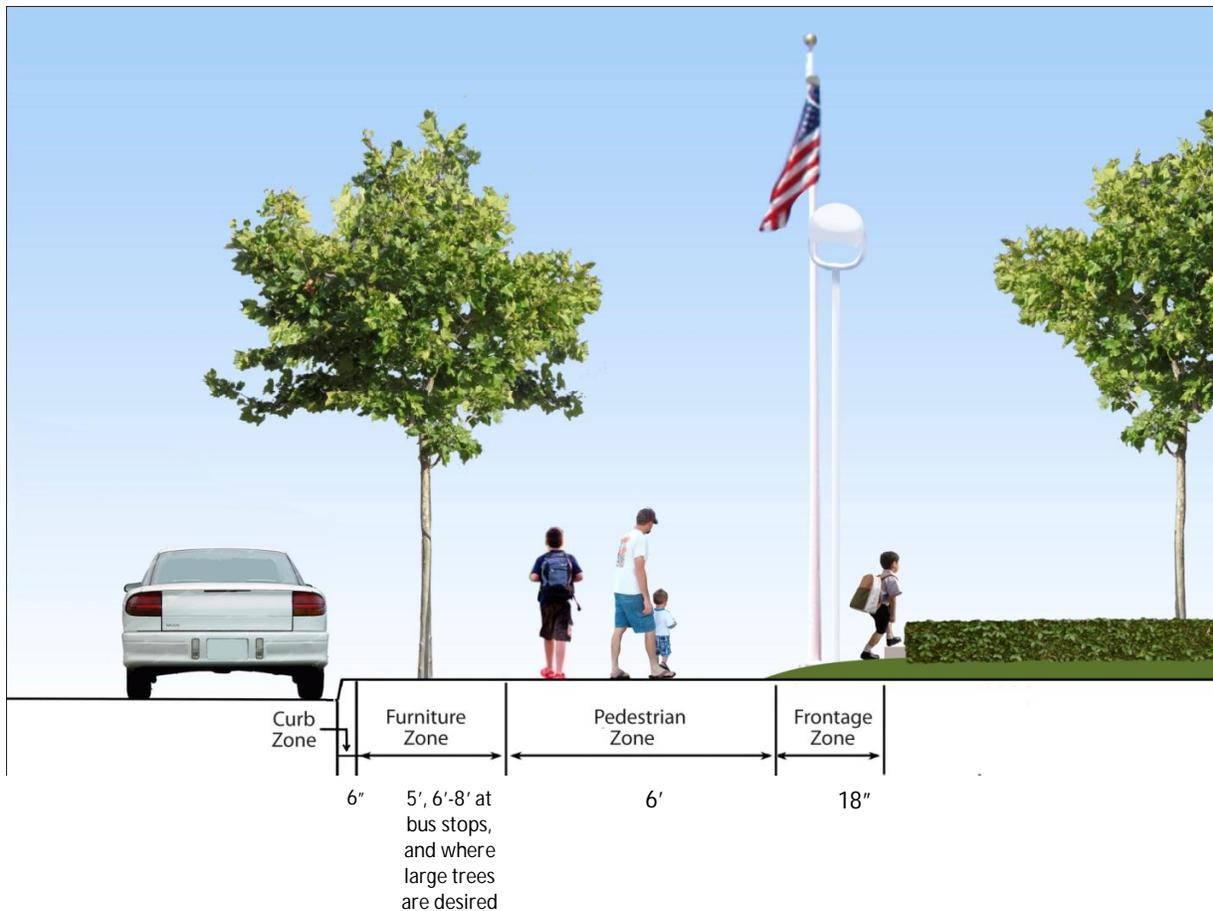


OFFICE PARK

These streets are home to national and regional offices of financial institutions, government, large companies, and other uses. Local jurisdictions can expect pedestrians during the morning and evening commutes walking to and from their cars and bus stops. Visitors will use the sidewalks throughout the day and employees will need them during the lunch hour. The furniture zone should provide adequate buffer from parking lots.

PUBLIC FACILITIES

Public facilities streets, particularly streets near schools, libraries, and civic centers, require special attention and treatment. High pedestrian volumes are expected during peak times, such as school pick-up and drop-off, and during the morning and evening commute hours. Sidewalk design should accommodate these peak travel times and include adequate furniture zones to buffer pedestrians from the street. Public facilities are located in various types of streets ranging from local streets to boulevards with transit service.





Please note that the dimensions shown above are only the minimum required dimensions. The pedestrian zone refers to the minimum clear width of usable sidewalk space for pedestrians, not necessarily the actual width of the sidewalk.

DESIGN SPECIFICATIONS BY ROADWAY TYPE AND LAND USE

Table 7.2 lists minimum widths for the frontage, pedestrian, furniture, and curb zones, as well as minimum total widths. These minimums should not be considered the design width; in many cases, wider zones will be needed.

Table 7.2 Sidewalk Zone Widths for Each Land Use Context

	Boulevard	Avenue	Street
Low / Medium-Density Residential	Not applicable	Frontage: 18" Pedestrian: 5' Furniture: 4', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 11'	Frontage: 18" Pedestrian: 5' Furniture: 4' Curb: 6" Min. Width: 11'
Med / High Density Residential	Frontage: 18" Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 13'	Frontage: 18" Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 13'	Frontage: 18" Pedestrian: 6' Furniture: 4', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 12'
Neighborhood Commercial	Not applicable	Frontage: 18" Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 13'	Frontage: 18" Pedestrian: 6' Furniture: 4', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 12'
General Commercial	Frontage: 18" Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 13'	Frontage: 18" Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 13'	Not Applicable



	Boulevard	Avenue	Street
Mixed / Multi-use	Frontage: 30", 8' with café seating Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 14'	Frontage: 30", 8' with café seating Pedestrian: 6' Furniture: 4', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 13'	Frontage: 18" Pedestrian: 6' Furniture: 4' Curb: 6" Min. Width: 12'
Industrial	Frontage: 18" Pedestrian: 5' Furniture: 5' Curb: 18" Min. Width: 13'	Frontage: 18" Pedestrian: 5' Furniture: 4' Curb: 18" Min. Width: 12'	Frontage: 18" Pedestrian: 5' Furniture: 4' Curb: 18" Min. Width: 12'
Downtown Core / Main Street	Frontage: 30", 8' with café seating Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 14'	Frontage: 30", 8' with café seating Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 14'	Frontage: 30", 8' with café seating Pedestrian: 6' Furniture: 5' Curb: 6" Min. Width: 14'
Transit Districts Oriented	Frontage: 30" Pedestrian: 8' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 16'	Frontage: 30" Pedestrian: 8' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 16'	Frontage: 18" Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 13'
Office Park	Frontage: 18" Pedestrian: 5' Furniture: 5' Curb: 6" Min. Width: 12'	Frontage: 18" Pedestrian: 5' Furniture: 5' Curb: 6" Min. Width: 12'	Not Applicable
Public Facilities	Frontage: 30" Pedestrian: 8' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 16'	Frontage: 30" Pedestrian: 8' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 16'	Frontage: 18" Pedestrian: 6' Furniture: 5', 6'-8' at bus stops, and where large trees are desired Curb: 6" Min. Width: 13'



GENERAL GUIDELINES

The land uses included in the previous table cover those of most municipalities. For those few areas not covered, the following list provides general guidelines for sidewalks:

- The recommended minimum frontage zone width is 18 inches.
- The recommended minimum pedestrian zone width is 5 feet.
- The recommended minimum curb zone width is 6 inches or 18 inches where pedestrian or freight loading is expected and may conflict with obstacles in the furniture zone.
- The recommended minimum furniture zone width is 4 feet and 6 feet to 8 feet where bus stops exist.
- Low curbs (3 to 4 inches high) reduce the division between the traveled way and the sidewalk. They are favored in areas with significant pedestrian traffic. Low curbs also improve the geometry and feasibility of providing two perpendicular curb ramps per corner.

Some judgment may be needed on a case-by-case basis to establish actual widths of each of the four zones.

FOR MORE INFORMATION

Primary:

Americans with Disabilities Act Accessibility Guidelines (ADAAG)

Public Right-of-Way Accessibility Guidelines (PROWAG)

Secondary:

Federal Highway Administration (FHWA). *Manual on Uniform Traffic Control Devices*, "MUTCD." 2009.

American Association of State Highway Transportation Officials (AASHTO). *A Policy on the Geometric Design of Highways and Streets, 6th Edition*, "AASHTO Green Book." 2011.

Federal Highway Administration (FHWA). *Designing Sidewalks and Trails for Access*. 2001.

NCHRP Project 20-7 (232), *ADA Transition Plans: A Guide to Best Management Practices*. 2009.

NCHRP Project 3-62, *Guidelines for Accessible Pedestrian Signals*. 2007.



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