Technical Memorandum 1
Overview of Existing ADAAG and PROWAG Bus Stop Guidelines

INTRODUCTION

The accessibility of transportation facilities, including bus stops, is regulated by the Americans with Disabilities Act of 1990. The Act empowered the United States Access Board to develop and adopt specific accessibility guidelines. These guidelines, pertaining to transportation facilities are recorded in the Americans with Disabilities Act Accessibility Guidelines that were adopted in 2006 and the Public Right-of-Way Accessibility Guidelines that were proposed in 2011.

The United States Access Board is an independent federal agency that supports equality for people with disabilities by developing accessibility guidelines and standards for the built environment, transit vehicles, telecommunications equipment, medical diagnostic equipment, and information technology. The U.S. Access Board also offers technical assistance and training on these requirements and accessible design and continues to enforce accessibility standards that cover federally funded facilities.

ADA ACCESSIBILITY GUIDELINES

After the passage of the 1990 Americans with Disability Act (ADA), the U.S. Access Board developed, and routinely updates, the ADA Accessibility Guidelines (ADAAG) that the United States Department of Justice (USDOJ) and the United States Department of Transportation (USDOT) have adopted into enforceable standards. Municipalities are required to comply with the ADAAG when designing, building, and improving elements in the built environment; including bus stops, sidewalks and other pedestrian facilities. The ADAAG includes specific guidelines for various elements of transportation facilities under Section 810.

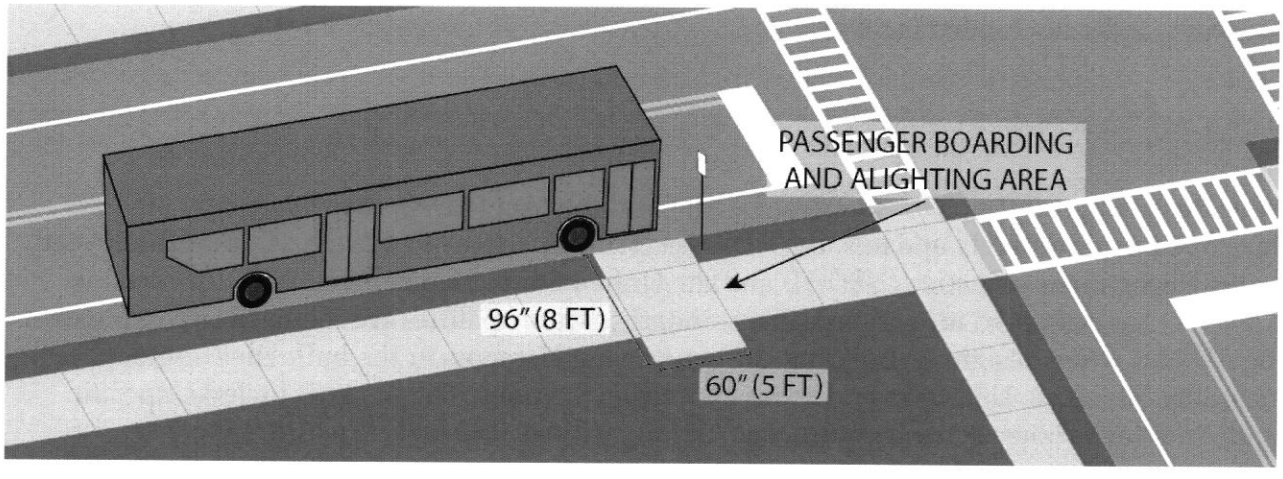
ADAAG Online Resource:
All of the information presented within this section is available online at the United States Access Board's website
https://www.access-board.gov/guidelines-and-standards/transportation/facilities/ada-standards-for-transportation-facilities

Bus Boarding and Alighting Areas

Bus boarding and alighting area guidelines are detailed under Section 810.2 of the ADAAG. The section includes four specific guidelines:

Surface	• Bus stop boarding and alighting areas shall have a firm and stable surface.
Dimension	• Bus stop boarding and alighting areas shall be at a minimum 96 inches long and 60 inches wide.
Connection	• Bus stop boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian paths by an accessible route.
Slope	• If parallel to the roadway, the slope of the boarding and alighting area shall be the same as the roadway. If perpendicular to the roadway, the slope of the boarding and alighting area shall not be steeper than 1:48 (approx. 2%)

Figure 1-1: Example of an ADA Compliant Passenger Boarding and Alighting Area

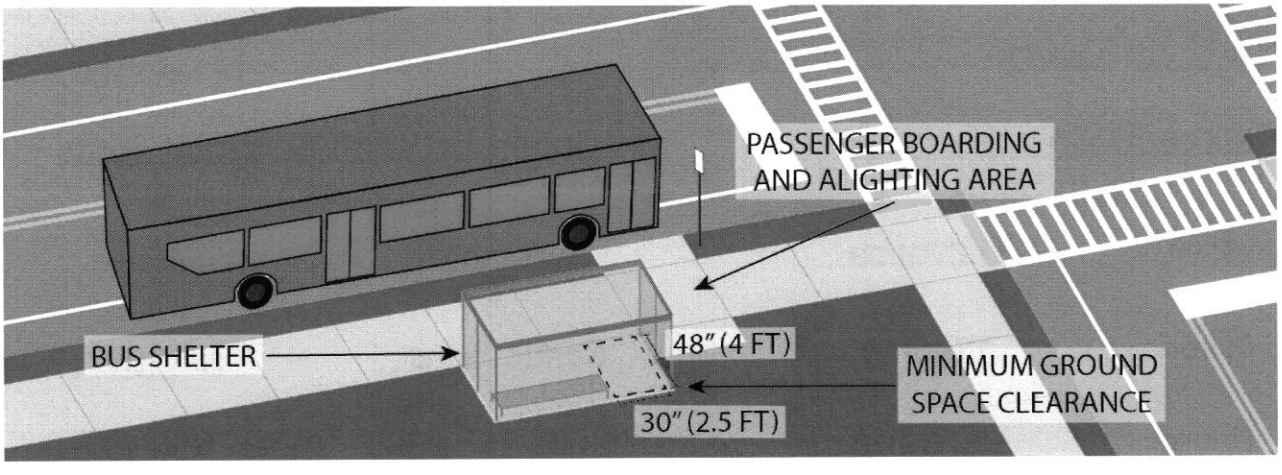


Bus Shelters

Bus shelter guidelines are provided in Section 810.3 of the ADAAG. The guidelines state that:

Connection	• Bus shelters shall be connected by an accessible route to an accessible boarding and alighting area.
Minimum Ground Space Clearance	• Bus shelters shall provide a minimum clear floor or ground space entirely within the shelter.
Surface	• Floor or ground surfaces shall be firm and stable; changes in level are not permitted.
Dimension	• Clear floor or ground surfaces shall be a minimum of 30 inches by 48 inches.
Position	• Floor or ground space shall be positioned to either forward or parallel approach to an element.
Maneuvering Clearance	• Where floor or ground space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearance shall be provided. • **Forward Approach**: Alcoves shall be a minimum of 60 inches wide where the depth exceeds 24 inches. • **Parallel Approach**: Alcoves shall be a mimimum of 60 inches wide where the depth exceeds 15 inches.

Figure 1-2: Example of an ADA Compliant Bus Shelter



Bus Signs

Bus route identification signs shall comply with ADAAG Sections 703.5.1 through 703.5.4, and 703.5.7 and 703.5.8. In addition, to the maximum extent practicable, bus route identification signs shall comply with 703.5.5. However, bus schedules, timetables, and maps that are posted at the bus stop or bus bay do not have to comply.

Finish and Contrast	• Characters and their background shall have a non-glare finish and the characters shall contrast with their background (light characters on a dark background or dark characters on a light background).
Case	• Characters shall be uppercase or lowercase, or a combination of both.
Style	• Characters shall be conventional in formal. Characters cannot be italic oblique, script, highly decorative, or of other unusual forms.
Character Proportions	• Characters shall be selected from fonts where the width of the uppercase letter "O" is 55 percent minimum and 110 percent maximum of the height of the uppercase "I".
Stroke Thickness	• Stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 30 percent maximum of the height of the character.
Character Spacing	• Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces. Spacing between individual characters shall be 10 percent minimum and 35 percent maximum of character height.
Character Height	• Minimum character height shall comply with Table 703.3.5. Viewing distance is measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign.

Generally Compliant Fonts (San Serif)		Generally Non-Compliant Fonts (Serif)	
Arial	Helvetica	Century	Garamond
Calibri	Tahoma	Comic Sans	Georgia
Futura	Verdana	Courier New	Times New Roman

PROPOSED PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES

The 2011 proposed Public Right-of-Way (PROW) Accessibility Guidelines build upon the 2006 ADAAG and consequently the currently adopted and enforceable USDOT and USDOJ standards. The proposed guidelines provide detailed guidance on pedestrian facilities in the public right-of-way that are not addressed in ADAAG's Section 402 and in some cases establish or change minimum or maximum measurements for items in the current ADAAG.

PROWAG Online Resource:
All of the information presented within this section is also available online at the United States Access Board's website
https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/proposed-rights-of-way-guidelines

Accessible Pedestrian Routes

An accessible pedestrian route provides a continuous and unobstructed path of travel for pedestrians with disabilities within or coinciding with a pedestrian circulation path. Accessible pedestrian route guidelines draw from numerous sections of the Proposed PROW Guidelines including:

- Chapter R2: Sections R204, R206, R208, R209, R210
- Chapter R3: Sections R302, R305, R306
- Chapter R4: Sections R402, R403, R404, R406, and R407

Pedestrian access routes summarized in this section apply to sidewalks, pedestrian street crossings, and pedestrian crossing signals.

Accessible Widths

Accessible widths are included under Section R302.3 in the PROWAG. In general, a minimum continuous clear width of 4 feet is required for pedestrian pathways.

Continuous Width	• The continuous clear width of pedestrian access routes shall be 4 feet, exclusive of the width of the curb.
Passing Spaces	• On pathways where the clear width of pedestrian access routes is less than 5 feet, passing spaces need to be provided at least every 200 feet. Passing spaces must be a minimum of 5 feet by 5 feet and are permitted to overlap pedestrian access routes.
Medians and Pedestrian Refuge Islands	• The minimum width increases to 5 feet for pathways within medians and pedestrian refuge islands.

Accessible Grades

Pathway grades are detailed under Section R302.5 and R302.6 in the PROWAG. Guidelines for grades will vary based on direction and pathway element.

Running Slope	• Generally, a pathway's running slope can be no greater than 5 percent. This includes street crossings. • Where the pathway is alongside a street or highway (e.g., a sidewalk), it is allowed to be the general grade established for the adjacent street or highway (but not steeper.)
Cross Slope	• A pathway's cross slope may not exceed 2 percent. However, two exceptions are allowable under the Proposed Guidelines: • **Exception #1:** At pedestrian street crossings without yield or stop control – Where vehicles generally proceed through an intersection without slowing or stopping—the cross slope for the street crossing can be up to 5 percent. Where there is a yield or stop control, the 2 percent maximum rule applies. • **Exception #2:** At mid-block pedestrian street crossings, the cross slope can equal the street or highway grade.

Surfaces

Surfaces of pedestrian access routes – detailed under Section R302.7 – and elements must be firm, stable, and slip resistant. They must be generally planar, with flush grade breaks and pavement connections.

Vertical Surface Discontinuities	• Vertical surface discontinuities cannot exceed 0.5 inches in height, and those between one-quarter and 0.5 inches must be beveled with a slope no steeper than 50 percent.
Horizontal Openings	• Horizontal openings in gratings and joints can be no wider than 0.5 inches, with elongated openings in gratings placed so that the long dimension is perpendicular to the dominant direction of travel.
Flangeway Gaps	• Where a pedestrian pathway crosses and at-grade rail line, the pedestrian access route surface must be level and flush, aligned with top of the rail. Flangeway gaps at pedestrian crossings cannot exceed 2.5 inches on non-freight rail track and 3 inches on freight rail track.

Protruding Objects

Protrusions are objects which have leading edges that encroach upon the walk path. Protruding projects have the potential to be a hazard for pedestrians, especially those who are blind or have low vision. ADAAG and the Proposed PROW Guidelines specify that protrusions along a walk path that fall within a height of 27 inches to 80 inches from walking surface must not protrude more than 4 inches into the vertical clearance of the walk path. Examples of typical protrusions are mounted signs, window ledges, and cables that support utility poles.

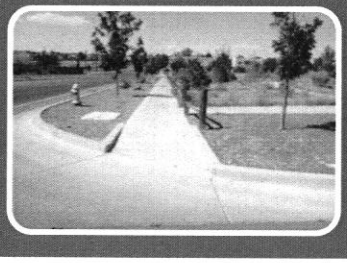
Curb Ramps and Blended Transitions

Curb ramps and blended transitions provide grade transition points between sidewalks and the street. These transition points provide people with mobility and vision disabilities with a navigable pathway. Guidelines are provided in Section R304 of the PROWAG.

Curb Ramps

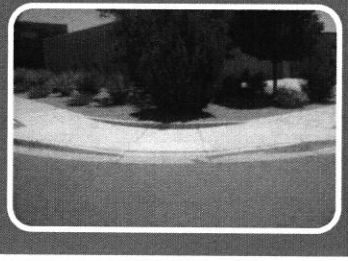
Generally, the components of a curb ramp are the ramp itself, a level landing at the top of the ramp, a landing at the bottom of the ramp, a detectable warning to alert pedestrians of a transition from sidewalk to street crossing.

Figure 1-3: Perpendicular and Parallel Curb Ramps



Perpendicular Curb Ramps

Have a running slope that cuts through or is built up to the curb at right agles or meets the gutter break at right abgles where the curb is curved.



Parallel Curb Ramps

Have a running slope that is in-line with the direction of sidewalk travel and lower the sidewalk to a level turning space where a turn is made to enter the pedestrian street crossing.

Perpendicular Curb Ramps

Perpendicular curb ramps are perpendicular to the street curb and permit pedestrians to cross the street perpendicular to vehicular traffic. Ideally, they are in line with the path of travel of both the sidewalk and the street crossing, but are not always possible within existing conditions. A distinguishing feature of perpendicular curb ramps is that each ramp generally serves a single street crossing; at a four-way intersection, two perpendicular ramps are needed at each corner.

Advantages

- Aligns perpendicular to vehiclular traffic
- Provides straight path of travel on tight radius corners
- Alligns with crossing direction on tight raduis corners
- Should be positioned with crosswalk
- At expected crossing location for all pedestrians

Disadvantages

- More expensive than a single diagonal ramp because two ramps must be constructed.
- Does not provide a straight path on large radius corners unless the ramp design is modified.
- Requries a wide sidewalk corridor or curb extension to accommodate the ramp and a level landing. The Proposed PROW Guidelines advise that these ramps can be provided in places where the sidewalk is at least 12 ft wide.

Parallel Curb Ramps

Parallel curb ramps typically consist of two ramps connecting to a shared level bottom landing. Ramps are oriented so that pedestrians travelling up or down the ramps travel parallel to vehicle traffic. These ramps are common on narrow sidewalks where there is little area for a top landing. The bottom landing is at street level and does not extend beyond the curb.

Advantages

- Requires minimual right-of-way. The Proposed PROW Guidelines advise that these ramps can be provided where the sidewalk is at least four feet wide.
- Enhances detectability of boundary between ramp and roaday because the ramp ends at a landing not in the street.
- Provides level turning and maneuvering area at the top and botton of the ramp.
- Provides clearly defined edges on the sides of the ramp for people with visual impairments.

Disadvantages

- Requires users continuing along the sidewalk to negotiate two ramp grades.
- Requires careful attention during construction to limit water/debris accumulation in the level bottom landing.

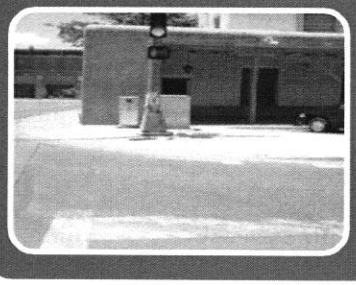
Table 1-1: Dimensions and Slopes for Perpendicular and Parallel Curb Ramp Elements

Element/ Specification	Perpendicular Curb Ramps	Parallel Curb Ramps
Ramp Run		
Running Slope	5 to 8.3 %	5 to 8.3%
Cross Slope	Maximum 2%	Maximum 2%
Width	Minimum 4 feet	Minimum 4 feet
Length	Maximum 15 feet	Maximum 15 feet
Flared Sides		
Slope	Maximum 10%	No flares for parallel ramps.
Top Landing Area		
Dimensions	Referred to as "turning space" (R304.2.1). Minimum 4 feet by 4 feet. Where constrained at the back of the sidewalk, a minimum of 5 feet in the direction of the ramp run.	Not specified for parallel curb ramps. Per R407.6 for ramps other than curb ramps, a landing area as wide as the widest ramp run leading to landing at least 5 feet long is required at the top and bottom of each ramp run.
Slope	Maximum 2% in any direction.	Maximum 2% in any direction.
Bottom Landing Area		
Dimensions	Minimum 4 feet by 4 feet. Provided within width of pedestrian street crossing.	Minimum 4 feet by 4 feet. Where constrained by two or more sides, a minimum of 5 feet in the direction of the street crossing.
Running Slope	"Counter Slope" Maximum 5%	Maximum 2%
Cross Slope	Maximum 2% percent (Exceptions: at street crossings without yield or stop control: maximum 5%; at midblock crossings: equal to street or highway grade)	Maximum 2%

Blended Transitions

An alternative approach to providing access to street crossings is a category of treatment referred to as a blended transition. According to the Proposed PROW Guidelines, a blended transition is "a raised pedestrian street crossing, depressed corner, or similar connection between the pedestrian access route at the level of the sidewalk and the level of the pedestrian street crossing that has a grade of 5 percent or less."

Figure 1-4: Example of a Blended Transition



Blended Transition
A raised pedestrian street crossing, depressed corner, or similar connection between the pedestrian access route at the level of the sidewalk and the level of the pedestrian street crossing that has a grade of 5 percent or less

Figure 1-5 provides the allowable specifications for blended transitions under the Proposed PROW Guidelines.

Figure 1-5: ADA Specifications for Blended Transitions

Width	• Minimum clear width is 48 inches.
Running Slope	• 5% maximum
Cross Slope	• Shall not exceed 2%
Counter Slope	• No more than 5%
Surface	• Firm, stable, and slip resistant • Utility covers and gratings, and other objects should not be located on the blended transiition
Detectable Warnigns	• Minimum of 24 inches • Must be placed a the back of the curb at the flush transition between the street and sidewalk.

Pedestrian Street Crossings

Accessibility guidelines are also outlined for pedestrian crossings. A pedestrian access route shall be provided within pedestrian street crossings, including medians and pedestrian refuge islands, and pedestrian at-grade rail crossings. The pedestrian access route shall connect departure and arrival sidewalks.

Detectable Warning Surfaces

Detectable warning surfaces alert pedestrians of the boundary between pedestrian and vehicular routes where there is a flush rather than a curbed connection. In addition to curb ramps and blended transitions, detectable warnings are also required for the following locations:

- Pedestrian refuge islands
- Pedestrian at-grade rail crossings not located within a street or highway
- Boarding platforms at transit stops for buses and rail vehicles where the edges of the boarding platform are not protected by screens or guards+
- Boarding and alighting areas at sidewalk or street level transit stops for rail vehicles where the side of the boarding and alighting areas facing the rail vehicles is not protected by screens or guards.

Detectable warning surfaces are not required at pedestrian refuge islands that are cut-through at the street level and are less than six feet in length in the direction of pedestrian travel.

Accessible Pedestrian Signals and Pedestrian Pushbuttons

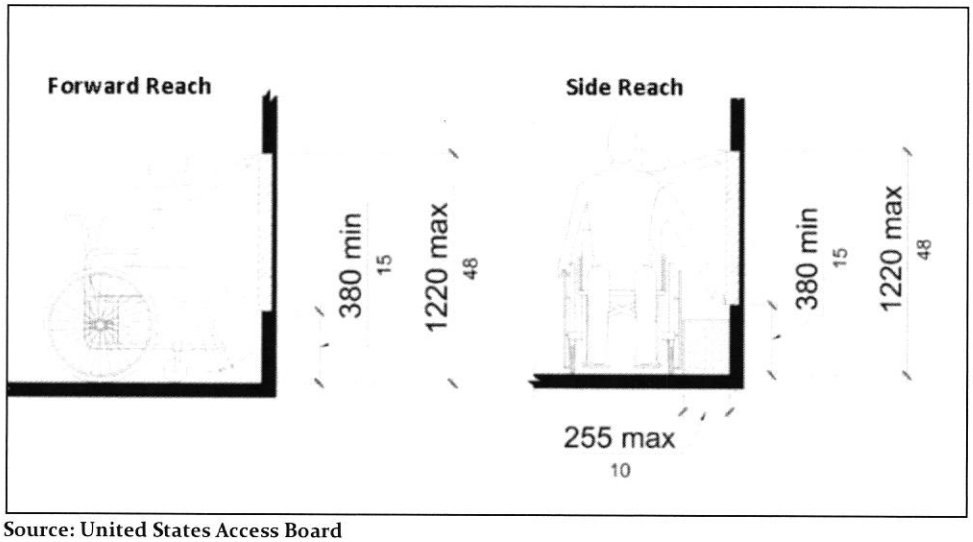
According to the Proposed PROW Guidelines, accessible pedestrian signals and pedestrian pushbuttons are devices that communicate information about the "walk" and "don't walk" intervals at signalized intersections in non-visual formats. Pedestrian signals located at pedestrian street crossings must comply with sections 4E.08 through 4E.13 of the Manual of Uniform Traffic Control Devices (MUTCD).

There needs to be a clear space adjacent to the pushbutton, connected to the pedestrian pathway, and the pushbutton must be mounted within a height range that makes it reachable to wheelchair users. The clear space must have a firm, stable, and slip resistant surface, with a running slope that is consistent with the grade of the adjacent pedestrian access route and a maximum cross slop of 2 percent. It must be a minimum of 48 inches by 30 inches and must be positioned to allow either forward or parallel approach to the pushbutton, with at least one fully unobstructed side adjoining the pedestrian route.

If the space is confined on all or part of three sides, it must have additional maneuvering space. For a forward approach, the clear space and additional maneuvering space must be at least 3 feet wide where the depth exceeds 2 feet. For a parallel approach, the clear space and additional maneuvering space need a minimum width of 5 feet where the depth exceeds 16 inches.

The allowable reach range necessitates mounting the pushbutton between 15 inches and 4 feet in height. If the approach is parallel, an obstruction would be permitted that extends a maximum of 10 inches into the clear space below the reach range.

Figure 1-6: Forward and Side Reach Minimums and Maximums



Source: United States Access Board