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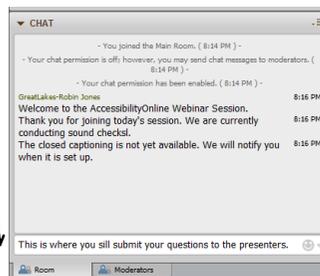
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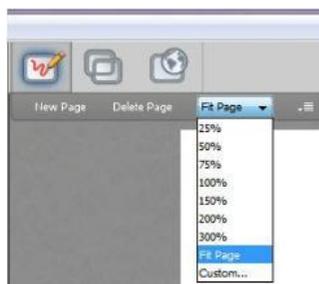
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Customize Your View *continued*



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Accessible Pedestrian Signals (APS)

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Presenters



Bruce Friedman
Federal Highway
Administration



Melissa Anderson
Access Board



Scott Windley
Access Board

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Session Agenda

- **FHWA's MUTCD provisions on Accessible Pedestrian Signals.**
- **PROWAG provisions on pedestrian access routes and street crossings.**
- **Questions?**

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APS in the MUTCD

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Sections to be discussed in today's webinar:

- **Section 4E.06 – Pedestrian Intervals and Signal Phases**
- **Section 4E.08 – Pedestrian Detectors**
- **Sections 4E.09 through 4E.13 – Accessible Pedestrian Signals and Detectors**

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Section 4E.06 – Pedestrian Intervals and Signal Phases

- **Pedestrian clearance time should be based on a walking speed of 3.5 fps from the curb to the far side of traveled way**
- **The total of the walk interval and the pedestrian clearance time should be based on a walking speed of 3 fps from the pushbutton location to the far side of traveled way**

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Section 4E.08 – Pedestrian Detectors

- Usually a pushbutton, but may be a passive detection device
- Should be capable of easy activation

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Section 4E.08 – Pedestrian Detectors

- Should be adjacent to a level all-weather surface that has an accessible route to the curb ramp

(The pushbutton in this photo is not accessible)



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Section 4E.08 – Pedestrian Detectors



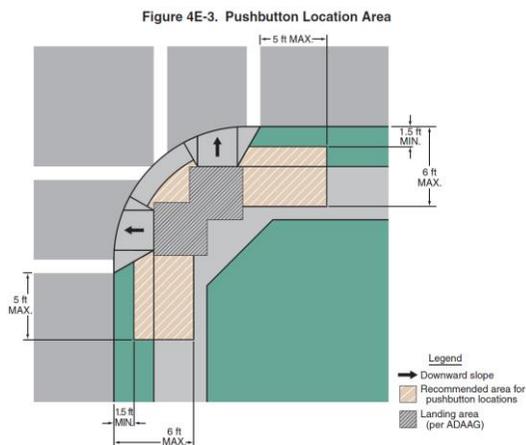
The pushbuttons in these photos are not accessible to anyone



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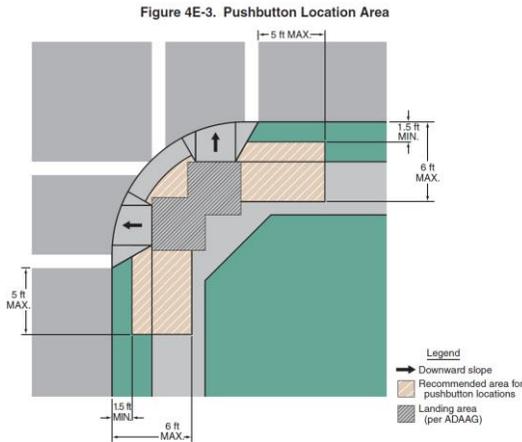
Section 4E.08 – Pedestrian Detectors

Should be between the crosswalk line and the edge of the curb ramp, but not more than 5 feet from the crosswalk line



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Section 4E.08 – Pedestrian Detectors

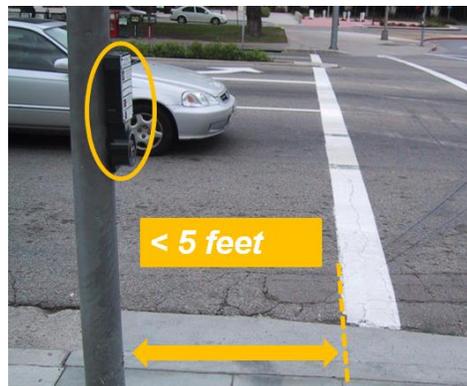


Should be between 1.5 and 6 feet from the edge of the curb, but if physical constraints exist, should be not more than 10 feet from the edge of the curb

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Section 4E.08 – Pedestrian Detectors

The face of the pushbutton should be parallel to crosswalk to be used



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Section 4E.08 – Pedestrian Detectors

Mounting height should be 3.5 to 4 feet above the sidewalk, which also satisfies the reach range that is specified in ADAAG

(The pushbutton in this photo is way too low)



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Section 4E.08 – Pedestrian Detectors



Unless there are physical constraints, two pushbuttons on the same corner should be at least 10 feet apart

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Section 4E.08 – Pedestrian Detectors



R10-3



R10-3a

Sign indicating which crosswalk is associated with the pushbutton is required

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Sections 4E.09 through 4E.13 – Accessible Pedestrian Signals and Detectors

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Section 4E.09 – General

- **Accessible pedestrian signals shall not be limited in operation by TOD or DOW**
- **At pretimed locations, pushbuttons may be used to activate the accessible pedestrian signal features**
- **Pushbuttons shall activate both the Walk signal and the accessible pedestrian signals**

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Section 4E.10 – Location

- **The provisions in Section 4E.08 are also applicable to accessible pedestrian signals, including the 10-foot separation**
- **If two pushbuttons on the same corner are less than 10 feet apart, a speech walk message and a speech pushbutton information message shall be provided**

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Section 4E.11 – Walk Indications

- **A tactile arrow that vibrates during the Walk interval is required**
- **An audible Walk interval that has the same duration as the Walk signal is required, except when the signal rests in Walk it should be only the first 7 seconds of the Walk signal**
- **After the audible Walk interval has terminated, the accessible pedestrian signals shall revert to the locator tone**

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Section 4E.11 – Walk Indications

- **When the pushbutton is separated by at least 10 feet from another pushbutton, the audible Walk interval shall be a percussive tone of 8 to 10 ticks per second**
- **If and only if the pushbutton is closer than 10 feet from another pushbutton, the audible Walk interval shall be a speech walk message**

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Section 4E.11 – Walk Indications

- The speech walk message shall be patterned after the following: “Elm. Walk sign is on to cross Elm.” Designations such as Street or Avenue shall also be included if it is necessary to avoid ambiguity.
- Speech walk messages should not include commands such as “cross Elm now” or information stating “it is safe to cross Elm”, because it is the pedestrian’s responsibility to check actual traffic conditions

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Section 4E.12 – Tactile Arrows & Locator Tones



Tactile arrows shall be located on the pushbutton unit either on or adjacent to the actual pushbutton on the same face, which is aligned parallel to the direction of travel in the associated crosswalk

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Section 4E.12 – Tactile Arrows & Locator Tones



Locator tones are required at all accessible pedestrian signal pushbutton detectors

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Section 4E.12 – Tactile Arrows & Locator Tones

- **Locator tones shall have a duration of 0.15 seconds or less and shall repeat at 1-second intervals**
- **Locator tones shall be deactivated when the signal is in the flashing mode, unless the pedestrian signal is activated from a flashing mode and except at pedestrian hybrid beacons**

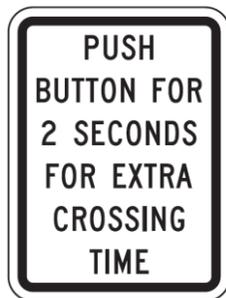
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Section 4E.13 – Extended Pushbutton Press Features

- If extended pushbutton press features are available, a press of less than 1 second shall activate only the normal pedestrian timing and associated accessible pedestrian signal features
- If extended pushbutton press features are available, a press of 1 second or more shall activate the special features

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Section 4E.13 – Extended Pushbutton Press Features



R10-32P

The special features may include additional crossing time, which would also require the installation of an R10-32P plaque

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Section 4E.13 – Extended Pushbutton Press Features

- The special features may include audible beaoning during the FDW interval for long or confusing crosswalks
- Audible beaoning shall be achieved by increasing the volume of the locator tone on the far side of the crosswalk, or on both ends of the crosswalk, or from a louder locator tone mounted on a pedestrian signal head on the far side of the crosswalk



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Section 4E.13 – Extended Pushbutton Press Features

- The special features may include speech pushbutton information messages
- Speech pushbutton information messages shall begin with the word “Wait” and shall be modeled after the following: “Wait to cross Elm at Sanders”
- If additional speech pushbutton information messages regarding usual signalization or geometric conditions are also provided, they shall follow the intersection identification information

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Official Interpretations related to accessible pedestrian signals

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4(09)-3(I) - APS with an Exclusive Pedestrian Phase

When an exclusive pedestrian phase is used at an intersection, and the pedestrian signals controlling the crosswalks on a given corner of the intersection both operate together such that the “Walk” indication is always simultaneous for both crosswalks, there is no need to use speech walk messages to distinguish between the crosswalks.

A fast-ticking percussive tone emitted simultaneously from both pushbuttons located less than 10 feet apart will properly serve the needs of visually impaired pedestrians under those circumstances.

Therefore, it is our official interpretation that Item C of Paragraph 3 in Section 4E.10 is not intended to apply to this situation.

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4(09)-26 (I) - Passive Activation of Locator Tones at Accessible Pedestrian Signals

Based on the factors described in the previous paragraphs of this letter, it is the FHWA's official interpretation that it shall be permissible for an agency to allow the locator tone to default to a deactivated mode provided that a passive pedestrian detection system is implemented that activates the locator tone at all times that a pedestrian is present within a 12-foot radius from the pushbutton location.

If pedestrian facilities (such as sidewalks) are present, the passive detection requirement would only apply to pedestrians who are on the pedestrian facilities within the 12-foot radius from the pushbutton location.

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4(09)-40 (I) - Audible Countdown Pedestrian Signals

The prohibition of an audible countdown during the pedestrian change interval is intentional. Both the FHWA and mobility experts who specialize on accessibility issues for persons with visual disabilities believe that there are serious safety concerns associated with an audible countdown.

It is therefore the FHWA's official interpretation that providing an audible countdown during the pedestrian change interval at an accessible pedestrian signal does not comply with the MUTCD.

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Frequently Asked Questions (FAQs) related to accessible pedestrian signals

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**When pedestrian countdowns are used
with accessible pedestrian signals, should
there be an audible countdown provided
for vision-impaired pedestrians?**

(Official Interpretation 4(09)-40 also addresses this topic.)

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When pedestrian countdowns are used with accessible pedestrian signals, should there be an audible countdown provided for vision-impaired pedestrians?

Some advocates for the visually disabled believe that the countdown information should also be provided in an accessible (audible) format. However, there are some significant problems with providing the countdown information to people with visual disabilities.

The countdown only occurs during the pedestrian change interval (FDW), during which pedestrians have already left the corner and are in the street. The Orientation and Mobility Division of the Association for Education and Rehabilitation of the Blind and Visually Impaired has investigated the issue of providing audible pedestrian change interval signals, including audible countdowns, and has recommended against them.

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When pedestrian countdowns are used with accessible pedestrian signals, should there be an audible countdown provided for vision-impaired pedestrians?

If the countdown were broadcast in audible format from the opposite side of the street to ensure those crossing can hear it to the end of the crossing, then the audible countdown will mask the other environmental and moving traffic sounds that blind people need to be able to hear and concentrate on once they have started their crossing. If the audible countdown were broadcast from the near side of the street, the sound will fade as the person crosses.

Also, the more audible messages there are at an intersection which already has APS pushbutton locator tones and tones to signal the Walk interval, the greater the likelihood that blind pedestrians will confuse one with the other.

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Will accessible pedestrian signals eventually become mandatory?

At this point, it is too early to determine whether accessible pedestrian signals will become mandatory.

The U.S. Access Board has initiated a formal rulemaking process for adopting ADA Public Right-of-Way Accessibility Guidelines (PROWAG). The current draft calls for accessible pedestrian signals to be required at all intersections equipped with pedestrian signals and at all pedestrian crossings across multi-lane roundabout entry or exit roadways, whenever new construction or alterations occur.

The FHWA's policy is to consider the U.S. Access Board's draft PROWAG as recommended practice for new and reconstructed signals.

If the proposed requirements are retained in the Access Board's final rule, the MUTCD will be revised in the future to reflect those requirements.

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Can accessible pedestrian signal features be used in conjunction with Rectangular Rapid Flashing Beacons or In-Roadway Warning Lights?



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Can accessible pedestrian signal features be used in conjunction with Rectangular Rapid Flashing Beacons or In-Roadway Warning Lights?

Some, but not all, of the accessible pedestrian signal features may be used at these locations. For example, it would be inappropriate to have a vibrotactile arrow or an audible Walk interval message since pedestrian signals are not present and a Walk signal is never displayed to pedestrians.



However, a pushbutton locator tone, a speech pushbutton information message, and an audible message when the lights are flashing would be appropriate and may be used at these locations. If an audible message is used, it should repeat twice at the beginning of the flashing period, and it should be a speech message that says, "Yellow lights are flashing."

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Additional Intersection Accessibility Issues

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Supplemental Notice of Proposed Rulemaking Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way; Shared Use Paths (2013)

- Draft of the Final Rule has been presented to the Board and regulatory assessment is in progress
- Will be submitted to the Office of Management and Budget for review
- Goal is to publish the Final Rule in 2017
- The Department of Justice and Department of Transportation must adopt



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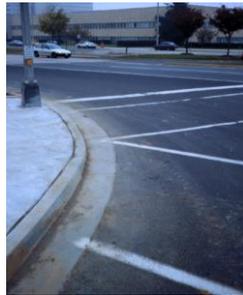
Accessibility Obligations

- New construction is required to be accessible.
- Alterations to existing facilities must be accessible to the maximum extent practicable within the scope of the project.
- Existing facilities that have not been altered can not deny access to persons with disabilities.



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Alterations and Project Scope



What's required??



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Alterations and Project Scope

What's required??

- APS → curb ramp?
- Curb ramp → APS?
- Curb ramp → receiving curb ramp?
- One crossing → full intersection?

Depends on project scope!



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Types of Pedestrian Facilities

Pedestrian Access Routes



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Pedestrian Access Route Basics

- **Contains 48" min pedestrian access route;**
- **Running slope 1:20 max or no steeper than road**
- **1:48 maximum cross slope;**
- **Surface is firm, stable and slip resistant;**
- **Minimize level changes and openings;**
- **No protruding objects within circulation path;**
- **Clear floor space at entrances, pedestrian pushbuttons, and other pedestrian features (drinking fountains, ATMs...)**

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Alternate Pedestrian Access Route in Work Zones



MUTCD Chapter 6

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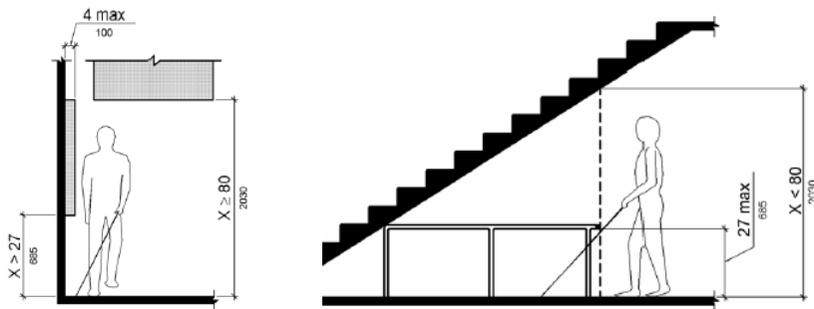
Pedestrian Circulation Area Protruding Objects



**No protruding objects the entire width of the
pedestrian circulation area**

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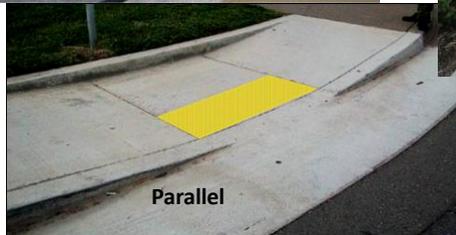
Pedestrian Circulation Area Protruding Objects



Objects between 27 inches and 80 inches may not protrude more than 4 inches

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Curb Ramps & Blended Transitions



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Curb Ramp Basics

- **1:12 max running slope (exception for length);**
- **1:48 cross slope (exception for non-stop condition);**
- **Width PAR is 48 inches min, Shared use path is full width;**
- **Turning space at top of perpendicular curb ramp;**
- **Flares – 1:10 max slope;**
- **Clear space at the bottom outside of travel lane;**
- **Flush transitions (no lips);**
- **Perpendicular grade breaks.**
- **Detectable warnings**

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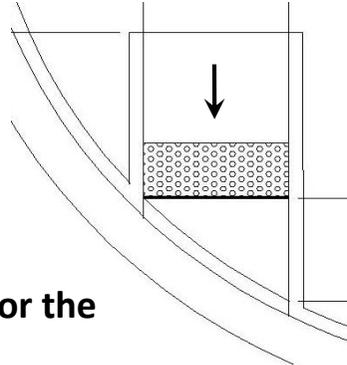
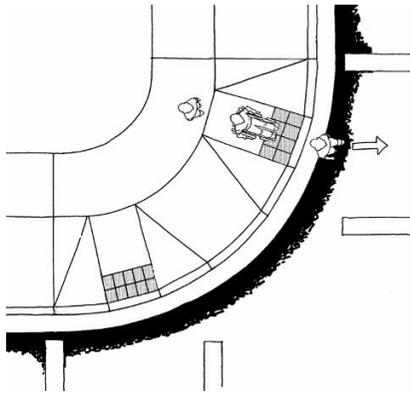
Detectable Warnings

Curb ramps and blended transitions must have detectable warnings to provide notice underfoot of the change from a pedestrian to a vehicular route.



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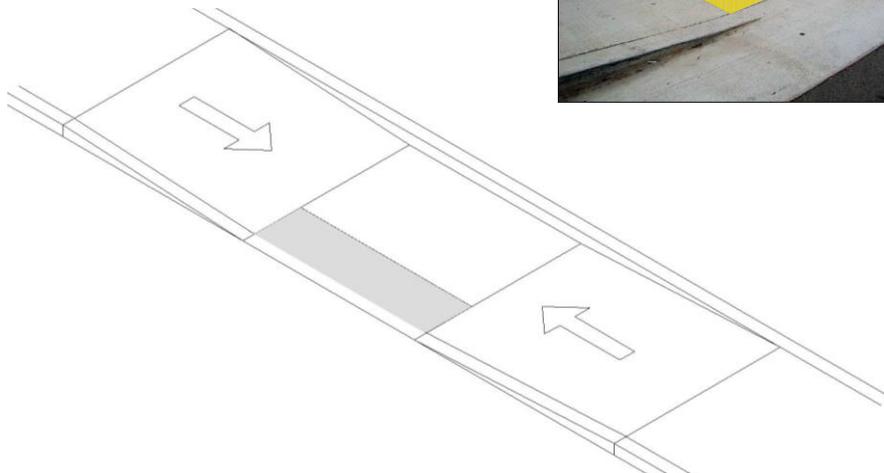
Perpendicular



Perpendicular to the curb or the street being crossed

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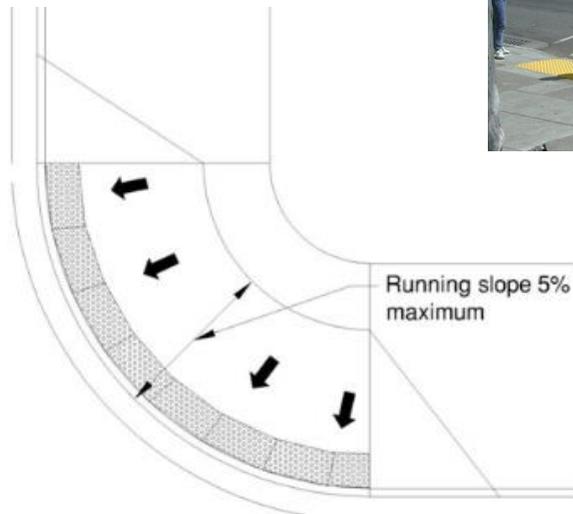
Parallel



Parallel to the curb or the street being crossed

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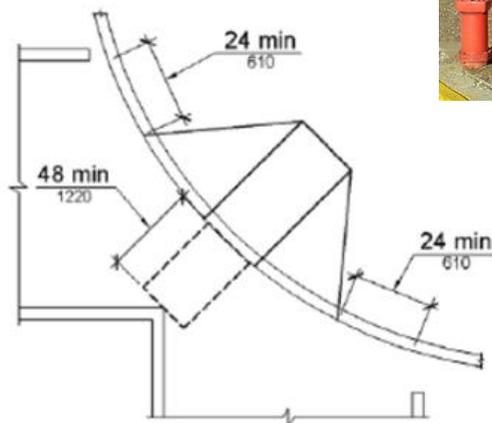
Blended Transition



Less than 5% slope to the curb or street

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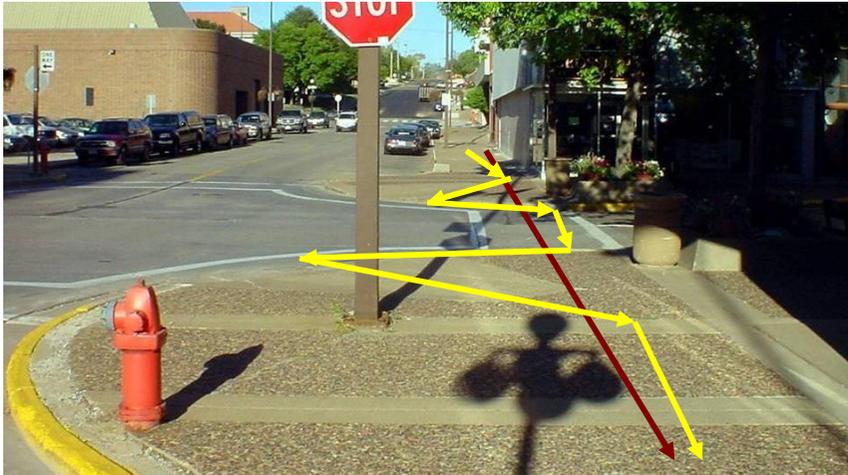
Diagonal



Serves two street crossings – only allowed in alterations where separate curb ramps are impracticable

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Curb Ramps & Blended Transitions



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Pedestrian Street Crossings



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Pedestrian Street Crossings

- Continuation of the pedestrian access route
- 2% max cross slope, 5% for through streets
- 5% maximum crown



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Crossing Treatments at Multi-lane Roundabouts



Multi-threat crash is large issue for RBTs



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Accessible Pedestrian Signals

- Connected to a pedestrian access route
- Adequate crossing time (3.5 fps or less)
- Meets operable parts requirements
- Meets reach range requirements



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Pushbutton Location



Pushbuttons must be connected by a pedestrian access route.



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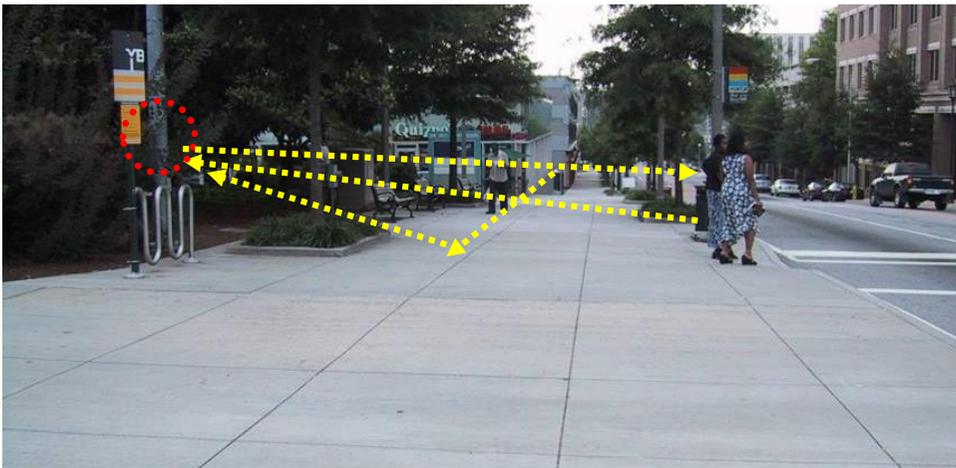
Pushbutton Location



Locator tones aid in locating the pushbutton and the crossing

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Pushbutton Location



- **Find the pushbutton. Now line up to cross.**
- **Missed your chance? Do it again**

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Crossing Time



WALKING SPEED AN ISSUE



START-UP TIME AN ISSUE

- 3.5 fps for pedestrian clearance time
- PROWAG references MUTCD requirements

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Operable Parts



- Operable with one hand
- Can not require tight grasping, pinching, or twisting of the wrist
- The force required to activate operable parts is 5 lbs max

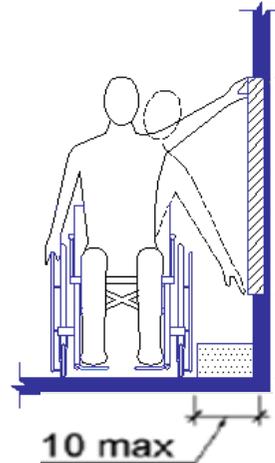


Usable with a closed fist

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Reach Ranges

- **Height - forward & side approach**
 - **Max. reach – 48" max**
 - **Min. reach – 15" min**
- **Allowable obstruction**
 - **Side reach within 10"**
 - **Forward reach – no obstruction or space**



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APS Resources

- *APS Guide* at www.walkinginfo.org/aps
- www.accessforblind.org
- On Access Board site at www.access-board.gov
 - *Interfacing Audible Pedestrian Signals and Traffic Signal Controllers*
 - *Special Report: Accessible Public Rights-of-Way, Planning and Designing for Alterations* (APS locations with various types of curb ramps)

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