Temporary Traffic Control Plans: “Who Left the Bikes and Peds Out”

April 22, 2021

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Rick Plenge

- Over 24 years of transportation engineering experience in both the public and private sectors
- Co-lead HDR's National Complete Street Practice Group
- National Complete Streets Instructor

Learning Objectives

- Explain the need for accommodating all modes within work zones
- Outline available local and federal guidance for accommodating pedestrians and bicyclists within work zones
- Identify available best practice resources for developing multimodal traffic control plans

Identifying the Need

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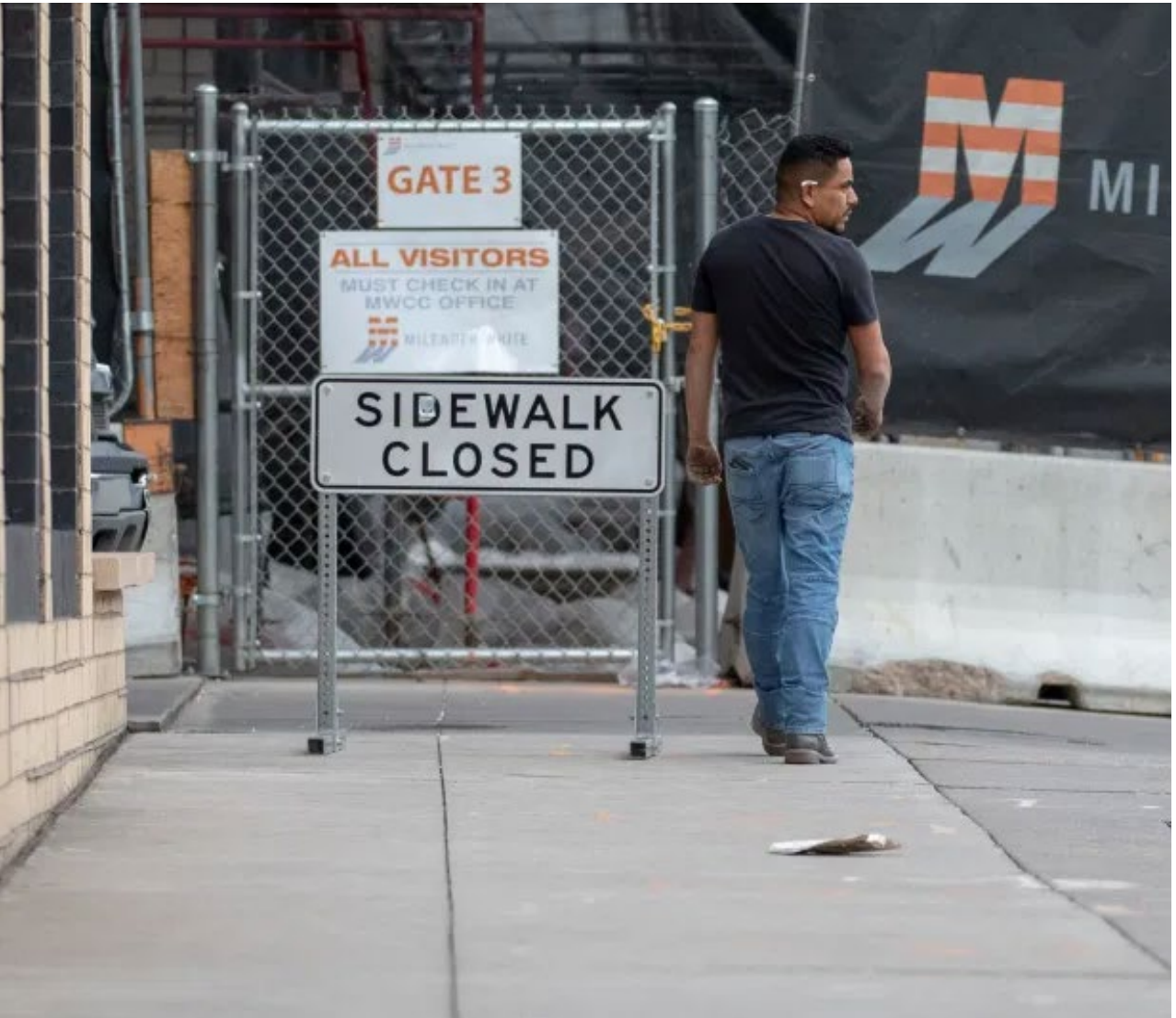

Identifying the Need

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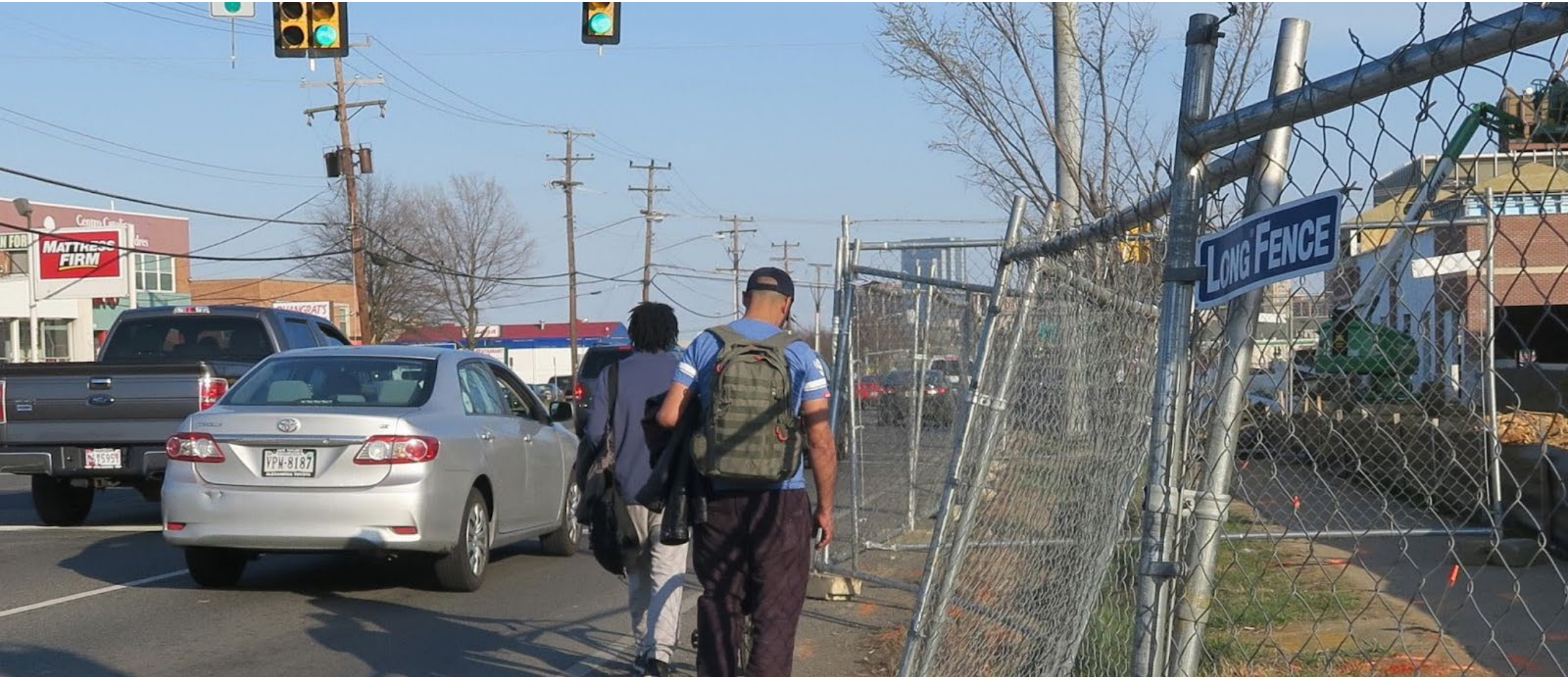
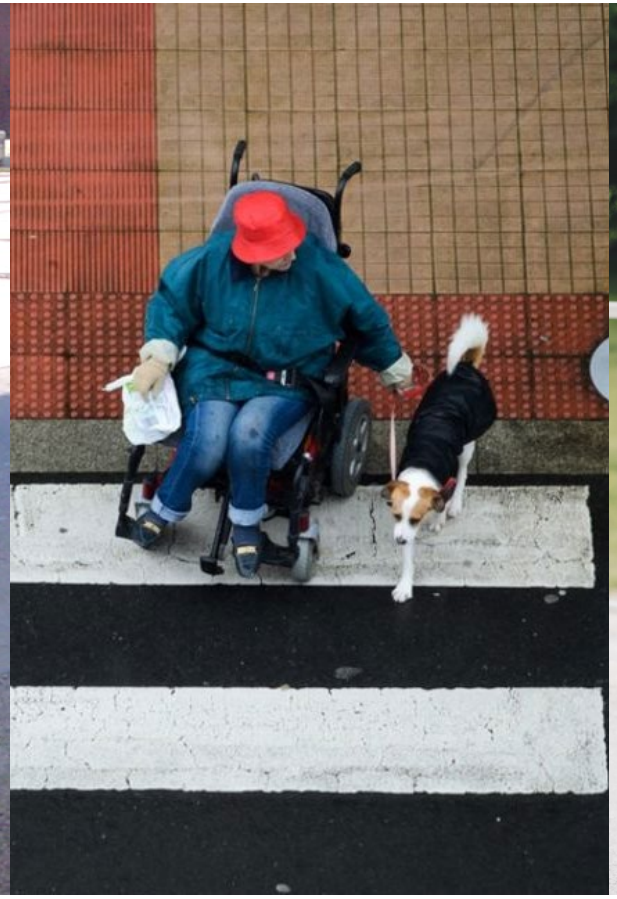
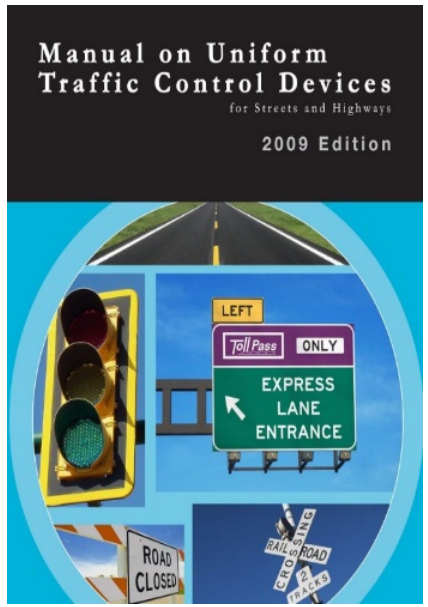
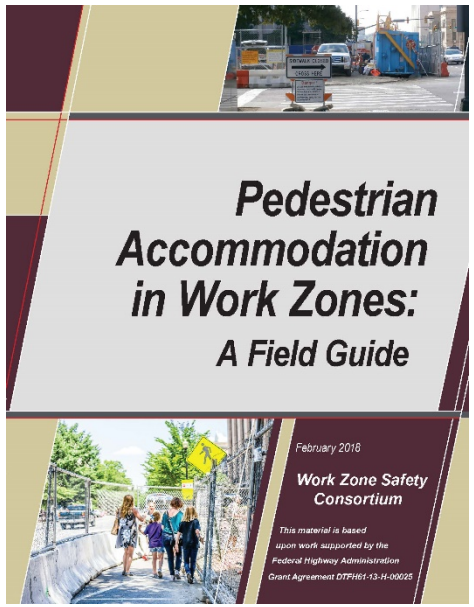


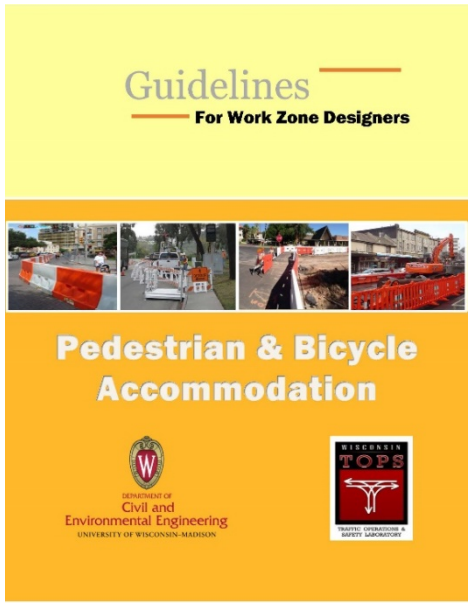
Who Are We Designing For

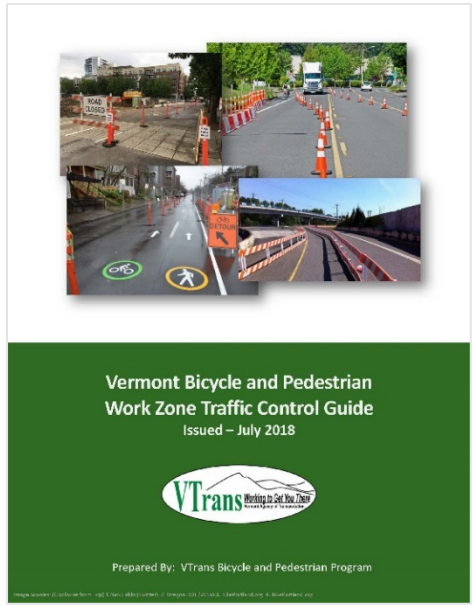


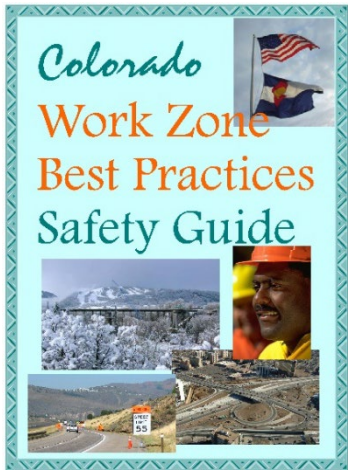
State and Federal Guidance

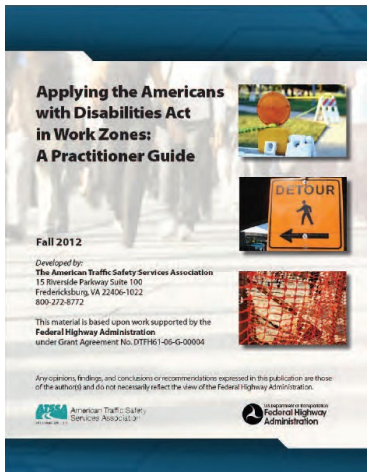


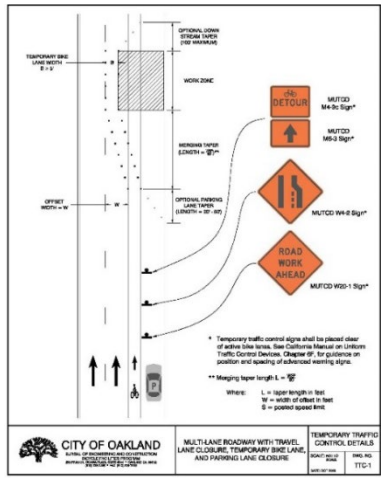








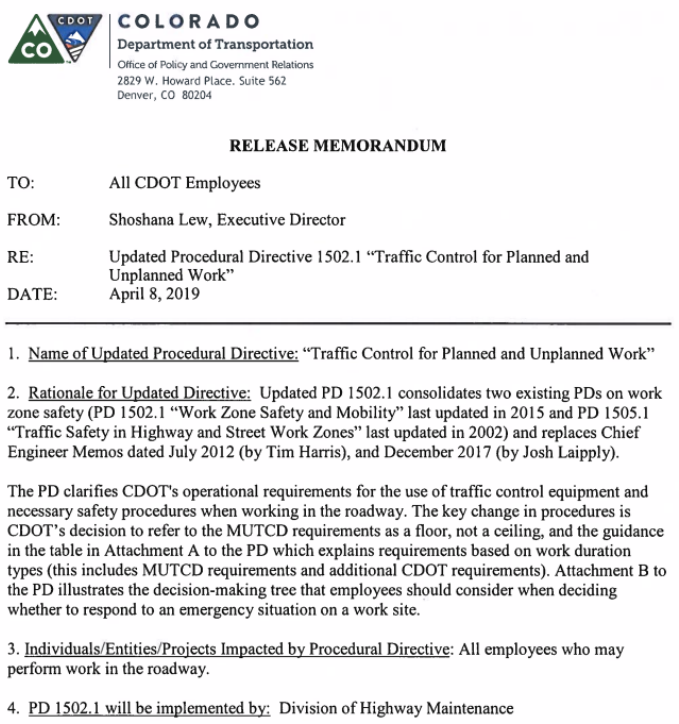




Agency Policies

Procedural Directive 1502.1 "Traffic Control for Planned and Unplanned Work" – April 9, 2019

- Use the MUTCD guidance as a "floor" rather than a "ceiling"
- "safe and efficient movement of both motorized and non-motorized traffic through or around temporary traffic control work zones



COLORADO
Department of Transportation
Office of Policy and Government Relations
2829 W. Howard Place. Suite 562
Denver, CO 80204

RELEASE MEMORANDUM

TO: All CDOT Employees

FROM: Shoshana Lew, Executive Director

RE: Updated Procedural Directive 1502.1 "Traffic Control for Planned and Unplanned Work"

DATE: April 8, 2019

1. Name of Updated Procedural Directive: "Traffic Control for Planned and Unplanned Work"

2. Rationale for Updated Directive: Updated PD 1502.1 consolidates two existing PDs on work zone safety (PD 1502.1 "Work Zone Safety and Mobility" last updated in 2015 and PD 1505.1 "Traffic Safety in Highway and Street Work Zones" last updated in 2002) and replaces Chief Engineer Memos dated July 2012 (by Tim Harris), and December 2017 (by Josh Laipply).

The PD clarifies CDOT's operational requirements for the use of traffic control equipment and necessary safety procedures when working in the roadway. The key change in procedures is CDOT's decision to refer to the MUTCD requirements as a floor, not a ceiling, and the guidance in the table in Attachment A to the PD which explains requirements based on work duration types (this includes MUTCD requirements and additional CDOT requirements). Attachment B to the PD illustrates the decision-making tree that employees should consider when deciding whether to respond to an emergency situation on a work site.

3. Individuals/Entities/Projects Impacted by Procedural Directive: All employees who may perform work in the roadway.

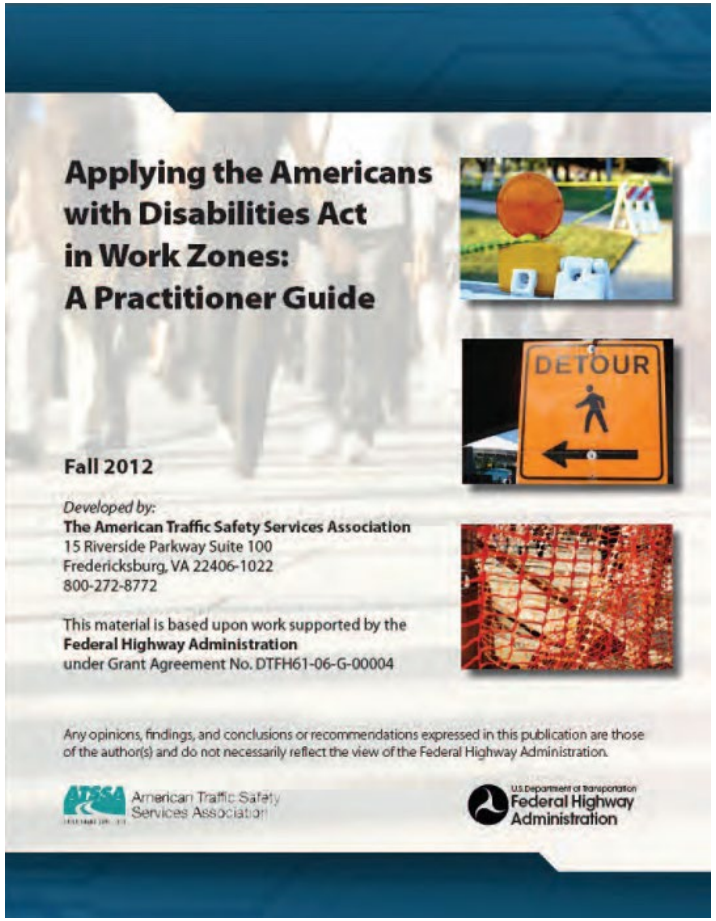
4. PD 1502.1 will be implemented by: Division of Highway Maintenance

https://www.codot.gov/library/traffic/work-zone-safety-and-work-zone-traffic-operations/work-zone-safety-mobility-program/cdot-policies-and-procedures/PD0805-1_Work_Zone_Procedure.pdf

Applying ADA in Work Zones: A Practitioner Guide

- Comprehensive discussion of the issues
- Works in concert with the MUTCD

https://www.youtube.com/watch?v=HVK-fVqHY78



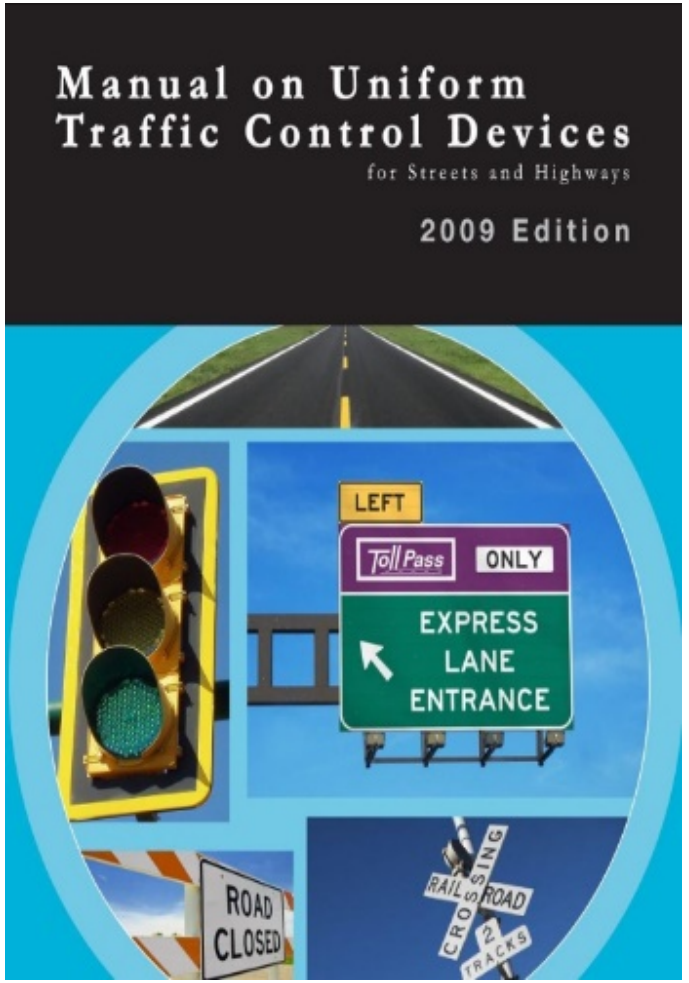
https://www.workzonesafety.org/training-resources/fhwa_wz_grant/atssa_ada_guide/#s1a

MUTCD

Part 6 – Temporary Traffic Control

Standard:

The needs and control of **all road users** (motorists, **bicyclists, and pedestrians** within the highway, or on private roads open to public travel (see definition in Section 1A.13), **including persons with disabilities** in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone **shall be an essential** part of highway construction, utility work, maintenance operations, and the management of traffic incidents.



MUTCD

Part 6 – Temporary Traffic Control (TTC)

Fundamental Principles

1. General plans or guidelines should be developed to provide safety for motorists, bicyclists, pedestrians, workers, enforcement/emergency officials, and equipment
2. Road user movement should be inhibited as little as practical
3. Motorists, bicyclists, and pedestrians should be guided in a clear and positive manner while approaching and traversing TTC zones and incident sites
4. To provide acceptable levels of operations, routine day and night inspections of TTC elements should be performed
5. Attention should be given to the maintenance of roadside safety during the life of the TTC zone
6. Each person whose actions affect TTC zone safety, from the upper-level management through the field workers, should receive training appropriate to the job decisions each individual is required to make
7. Good public relations should be maintained

MUTCD

- Advance notification of sidewalk closures shall be provided
- Adequate pedestrian access and walkways shall be provided
- Accessibility and detectability shall be maintained in a manner consistent with the existing facility
- Closure shall be made with a detectable barrier across full width of closed sidewalk

MUTCD Section 6D.01

Photo credit: Beneficial Designs

MUTCD

Pedestrian Channelization in Temporary Traffic Control Zones

Channelization devices

- Shall be detectable to users of long canes and visible to persons having low vision.
- Shall have a continuous bottom surface no higher that 2 inches
- Shall have a continuous top surface no lower than 32 inches

MUTCD 6F.63

- Traffic control devices should not intrude into the temporary pathway.
- If temporary pathway is less than 60 in wide, provide passing space every 200 ft

MUTCD 6F.68

POLL QUESTION

Does the worn path shown in the image require an accessible route during construction?

Yes or No?

POLL QUESTION

Does the sidewalk shown in the image require an accessible route during construction?

Yes or No?

Pedestrian Access

Do you have to accommodate ADA?

04 If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkways shall be provided. **If the TTC zone affects an accessible and detectable pedestrian facility**, the accessibility and detectability **shall** be maintained along the alternate pedestrian route.

MUTCD 6D.01

Pedestrian Access - ADA

6D.01 Pedestrian Considerations:

07. A. Pedestrians should not be led into conflicts with vehicles, equipment, and operations.

B. Pedestrians should not be led into conflicts with vehicles moving through or around the worksite.

C. Pedestrians should be provided with a convenient and accessible path that replicates as nearly as practical the most desirable characteristics of the existing sidewalk(s) or footpath(s).

Pedestrian Access - ADA

6D.01 Pedestrian Considerations:

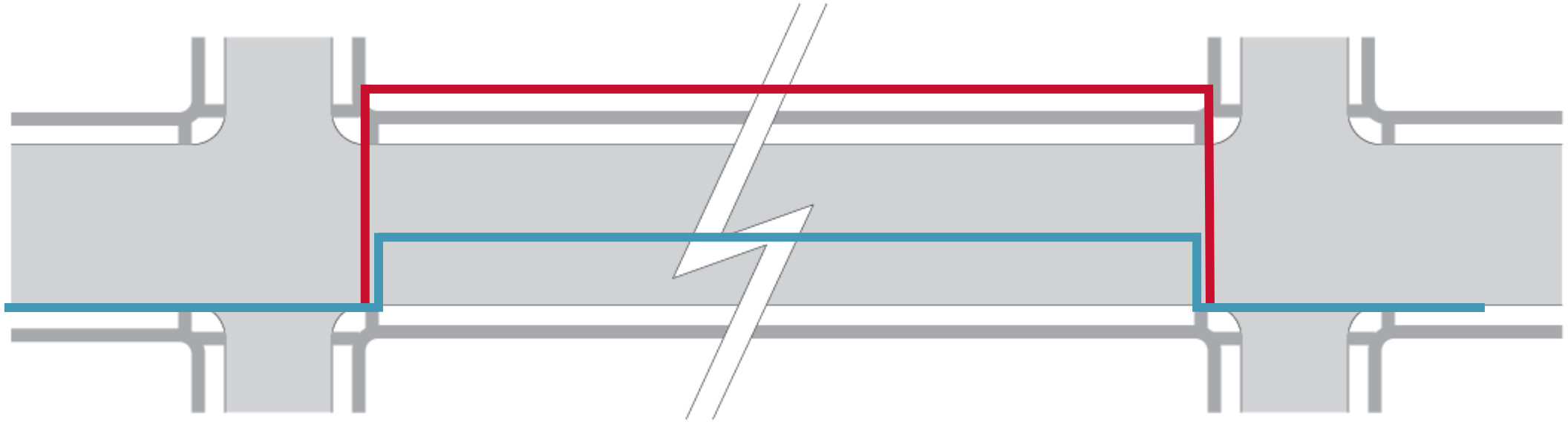
11 A smooth, continuous hard surface should be provided throughout the entire length of the temporary pedestrian facility. There should be no curbs or abrupt changes in grade or terrain that could cause tripping or be a barrier to wheelchair use.

Pedestrian Access – Best Practices – Tactile Guide Strips

Supports visually impaired pedestrian wayfinding and navigation through construction work zones

Reroute or not?

- 1st Preference: Maintain route
- 2nd Preference: Alternate route
- 3rd Preference: Alternate means - Shuttle



Pedestrian Access – ADA - Width

6D.01 Pedestrian Considerations:

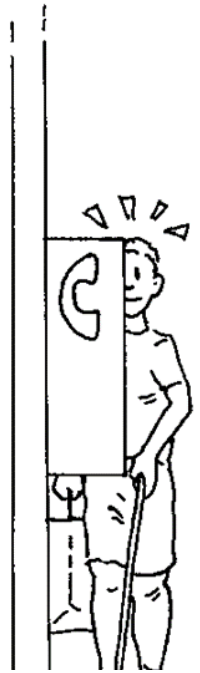
- Same as PROWAG
  - 5 feet in width
  - If 4 feet, provide 5 x 5’ passing space every 200 feet
  - COVID Considerations???

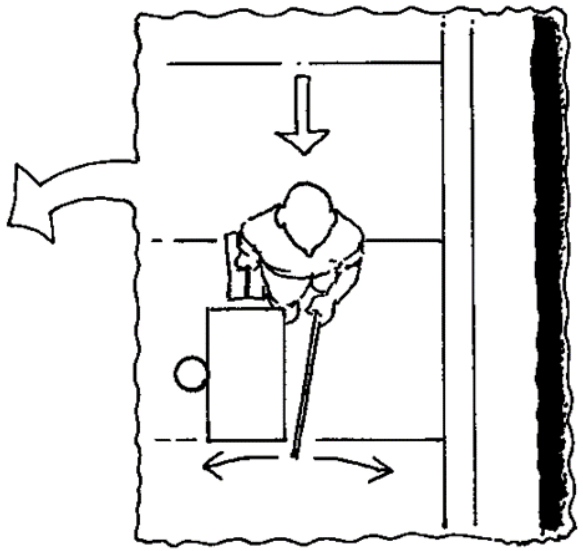
Pedestrian Closures – ADA - Channelization

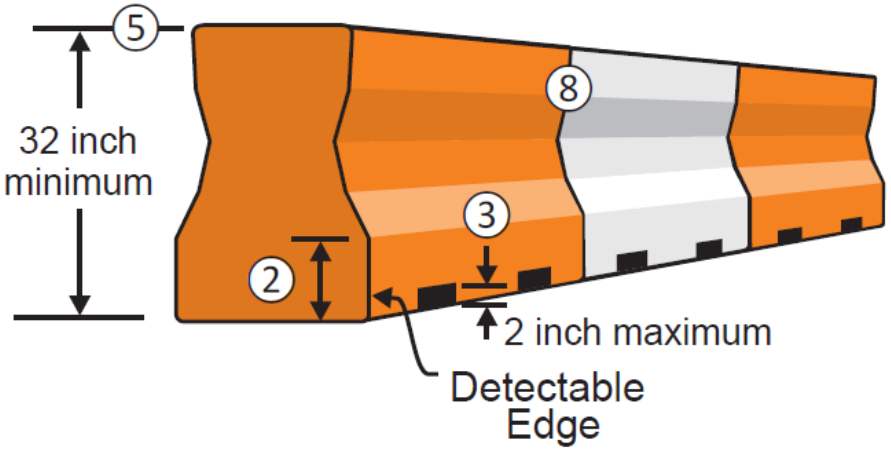
6F.63

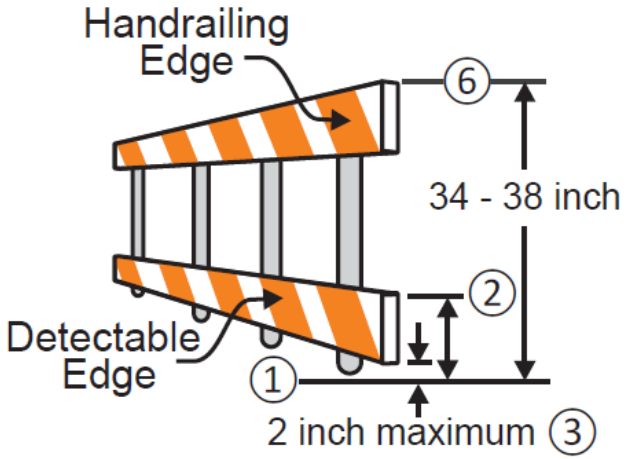
Channelization devices

- shall be detectable to users of long canes and visible to persons having low vision.
- shall have a continuous bottom surface no higher that 2 inches
- shall have a continuous top surface no lower than 32 inches
- Smooth surface, free of sharp/rough edges, able to support





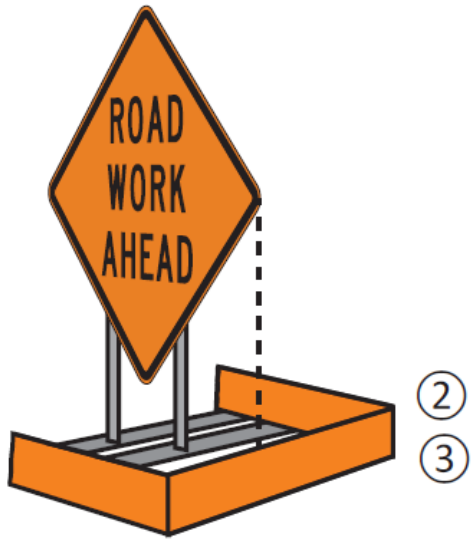




Pedestrian Closures

6D.01 Pedestrian Considerations:

03. Advance notification of sidewalk closures shall be provided by the maintaining agency.

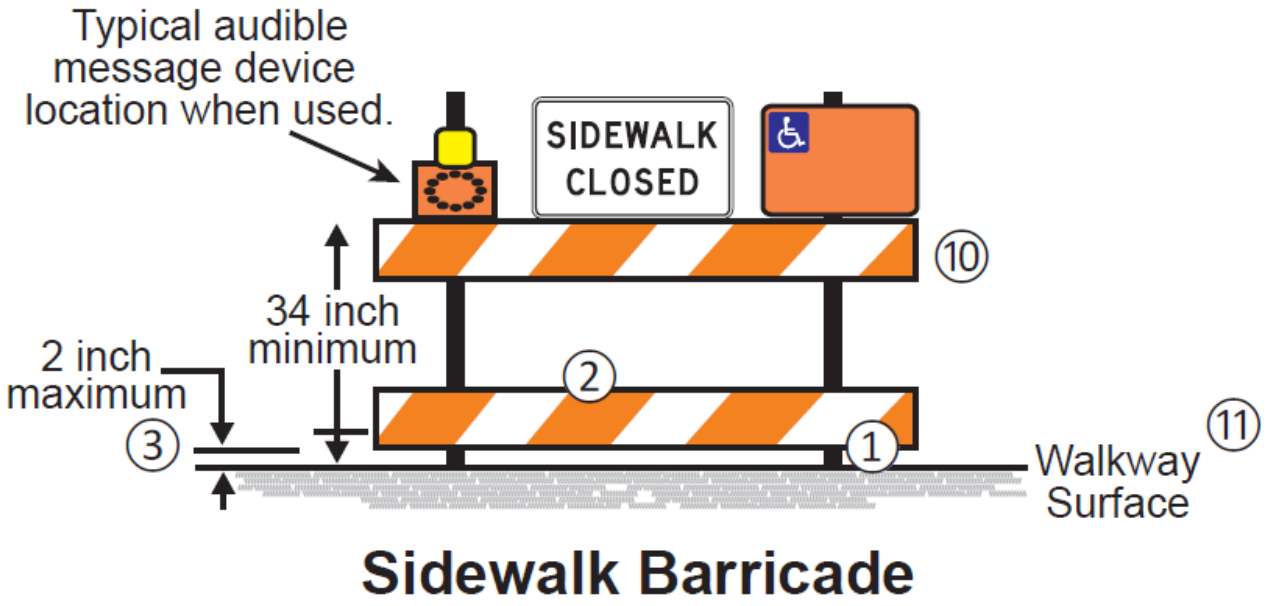


Detectable Edge
for Portable Sign Stand

Pedestrian Closures - ADA

Temporary barriers

Pedestrian Channelizer
using a Temporary Barrier

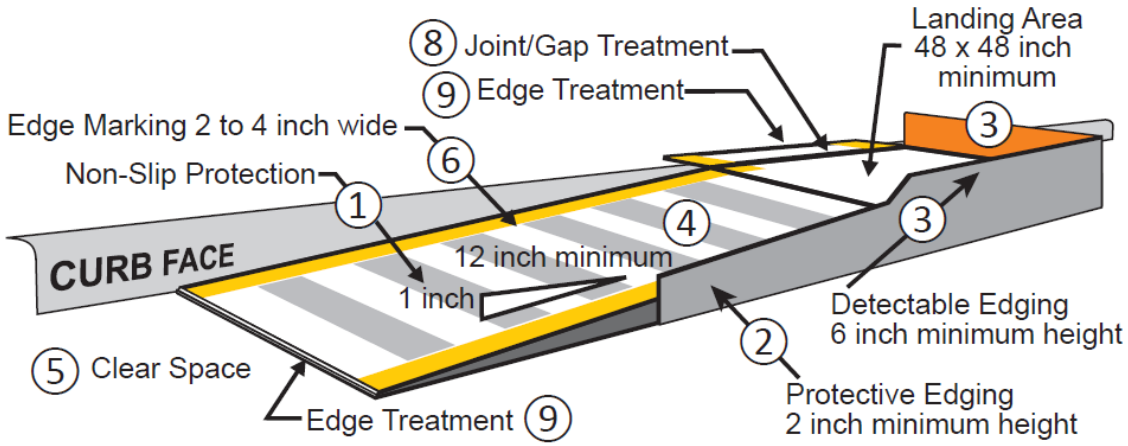


Sidewalk Barricade

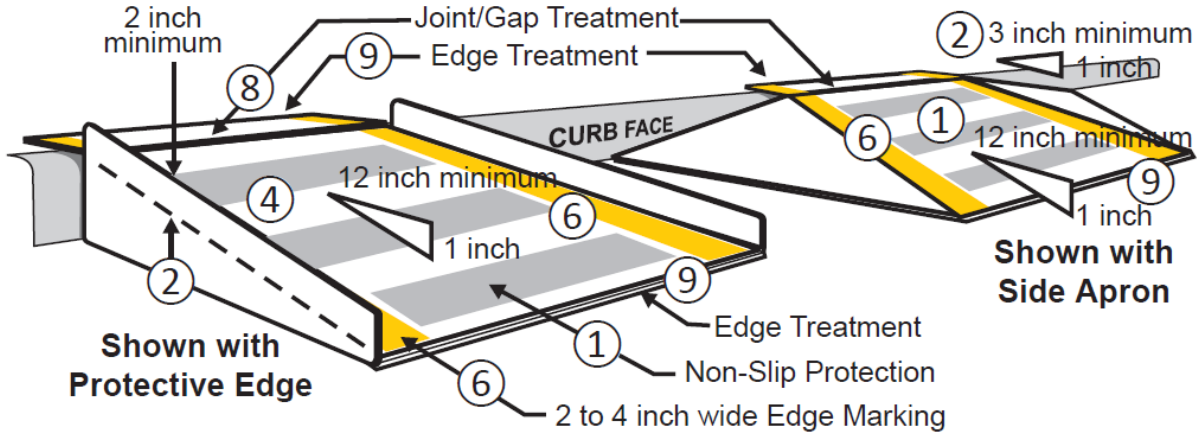
Pedestrian Closures - Ramps

Temporary Pedestrian Ramps

Temporary Curb Ramp - Parallel to Curb



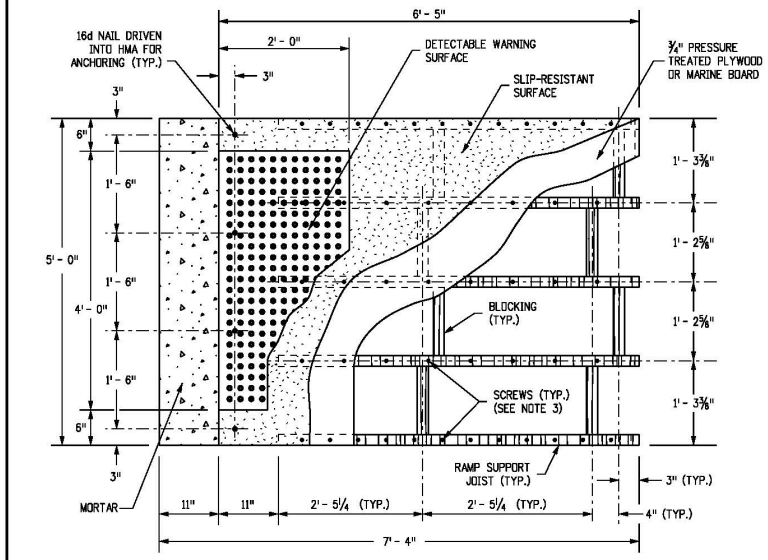
Temporary Curb Ramp - Perpendicular to Curb

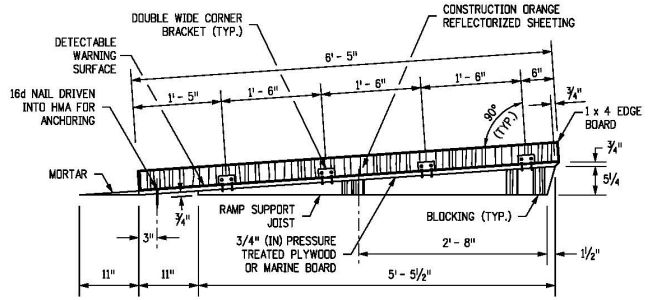


Pedestrian Closures - Ramps

Temporary Pedestrian Ramps

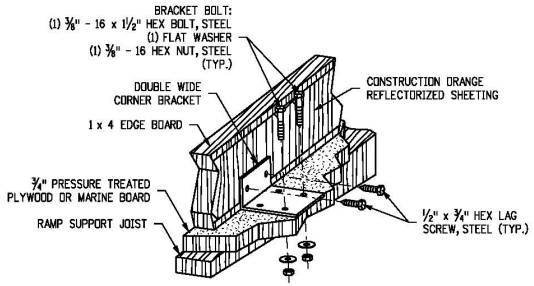
Standards

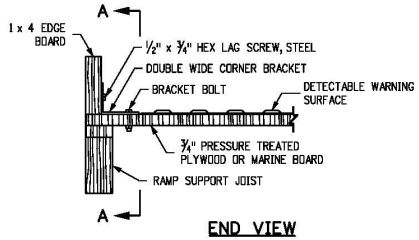


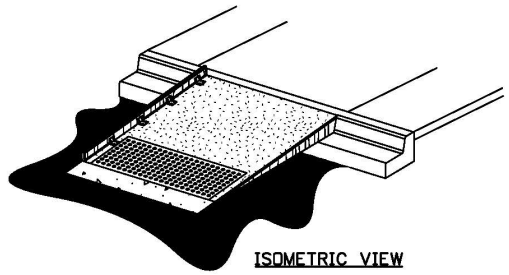


NOTES

1. A TEMPORARY PEDESTRIAN ACCESS ROUTE SHALL BE PROVIDED WHENEVER THE EXISTING PEDESTRIAN ACCESS ROUTE IN THE PUBLIC RIGHT-OF-WAY IS BLOCKED BY CONSTRUCTION, ALTERATION, MAINTENANCE, OR OTHER TEMPORARY CONDITIONS. FOR FURTHER WORK ZONE INFORMATION, PLEASE REFER TO CDOT'S WEBPAGE TITLED "ADA IN WORK ZONES".
2. THIS DESIGN ASSUMES OPTIMAL CONDITIONS AND A STANDARD CURB HEIGHT OF 6 INCHES. INSTALLED RAMPS SHALL BE NO STEEPER THAN 8.3% AND SHALL HAVE A CROSS-SLOPE OF 2.0% OR LESS. USE SHIMS OR GROUT AS REQUIRED TO ADJUST FOR EXISTING CONDITIONS AND TO PREVENT ROCKING. SHIMS SHALL BE NO HIGHER THAN 1 INCH AND SHALL BE SECURED TO THE RAMP. FOR CURBS SHORTER THAN 6 INCHES, INSTALL A RAMP ON THE SIDEWALK NO STEEPER THAN 8.3%, AND MADE OF GROUT OR AS APPROVED BY THE ENGINEER. ADJUSTMENTS TO THE RAMP DIMENSIONS SHOWN MAY BE REQUIRED TO MATCH EXISTING CONDITIONS.
3. SCREWS SHALL BE USED TO SECURE THE RAMP SURFACE. SPACING SHALL BE IN ACCORDANCE WITH THE CURRENT BUILDING CODE.
4. USE A SLIP-RESISTANT TREATMENT FOR THE SURFACE OF RAMP.
5. ALL FASTENERS SHALL BE GALVANIZED.
6. DO NOT INSTALL A HAND RAILING IF USING THE EDGE BOARD OPTION.







TEMPORARY PERPENDICULAR CURB RAMP

Computer File Information		Sheet Revisions	
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Last Modification Date: 02/23/17 Initials: LTA	(R-X)	02/23/17	Added this sheet.
Full Path: www.coloradodot.info/business/designsupport	(R-X)		
Drawing File Name: 6080109010.dgn	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

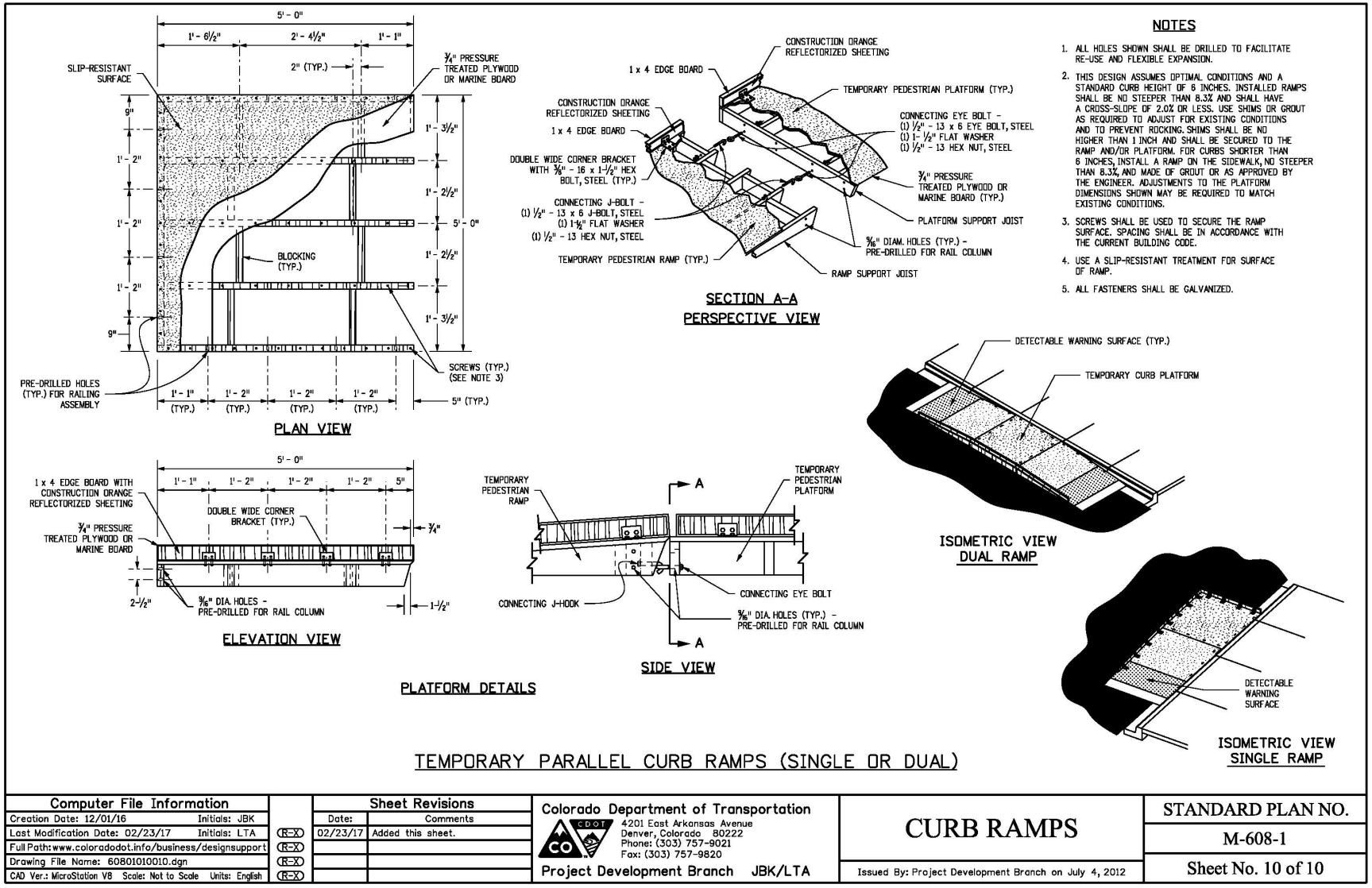
Colorado Department of Transportation
4201 East Arkansas Avenue
Denver, Colorado 80222
Phone: (303) 757-9021
Fax: (303) 757-9820
Project Development Branch JBK/LTA

CURB RAMPS

Issued By: Project Development Branch on July 4, 2012

STANDARD PLAN NO.
M-608-1
Sheet No. 9 of 10

Standards


NOTES
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2. THIS DESIGN ASSUMES OPTIMAL CONDITIONS AND A STANDARD CURB HEIGHT OF 6 INCHES. INSTALLED RAMPS SHALL BE NO STEEPER THAN 8.3% AND SHALL HAVE A CROSS-SLOPE OF 2.0% OR LESS. USE SHIMS OR GROUT AS REQUIRED TO ADJUST FOR EXISTING CONDITIONS AND TO PREVENT ROCKING. SHIMS SHALL BE NO HIGHER THAN 1 INCH AND SHALL BE SECURED TO THE RAMP AND/OR PLATFORM. FOR CURBS SHORTER THAN 6 INCHES, INSTALL A RAMP ON THE SIDEWALK, NO STEEPER THAN 8.3%, AND MADE OF GROUT OR AS APPROVED BY THE ENGINEER. ADJUSTMENTS TO THE PLATFORM DIMENSIONS SHOWN MAY BE REQUIRED TO MATCH EXISTING CONDITIONS.
3. SCREWS SHALL BE USED TO SECURE THE RAMP SURFACE. SPACING SHALL BE IN ACCORDANCE WITH THE CURRENT BUILDING CODE.
4. USE A SLIP-RESISTANT TREATMENT FOR SURFACE OF RAMP.
5. ALL FASTENERS SHALL BE GALVANIZED.
PLAN VIEW
SECTION A-A
PERSPECTIVE VIEW
ELEVATION VIEW
SIDE VIEW
ISOMETRIC VIEW
DUAL RAMP
ISOMETRIC VIEW
SINGLE RAMP
PLATFORM DETAILS
TEMPORARY PARALLEL CURB RAMPS (SINGLE OR DUAL)
Computer File Information
Creation Date: 12/01/16 Initials: JBK
Last Modification Date: 02/23/17 Initials: LTA
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Date: 02/23/17 Comments: Added this sheet.
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CURB RAMPS
Issued By: Project Development Branch on July 4, 2012
STANDARD PLAN NO.
M-608-1
Sheet No. 10 of 10

Pedestrian Access – Draft PROWAG Dimensions

Design Element		Criteria	Notes	PROWAG Section
Sidewalk and Pedestrian Access Route	Width	Min 4.0'	Median/island : Min 5.0'	R302.3
	Passing Spaces	Min 5.0' by 5.0' at max 200' intervals	Necessary where the clear width is less than 5.0'	302.4
	Grade	Matching street grade	Where feasible, max 5%	R302.5
	Cross slope	Max 2%	See PROWAG for Exceptions	R302.6
	Surface	Firm, stable, and slip resistant		R302.7
	Vertical discontinuities	Max 0.5"	Beveled with a slope less 50% (0.25' - 0.5')	R302.7.2
	Horizontal Openings	Max 0.5"		R302.7.3
	Flangeway Gaps	Max 2.5"	Non-freight rail track	R302.7.4
		Max 3.0"	Freight rail track	
Perpendicular Curb ramp	Width	Min 4.0'		R304.5.1
	Rise	Max 2.5'		R407.5
	Grade breaks	Perpendicular to the direction of the ramp	Not permitted on the ramp runs, turning spaces	R304.5.2
	Cross slope	Max 2%	See PROWAG for exceptions	R304.5.3
	Counter slope	Max 5%		R304.5.4
	Turning Space	Min (4.0' by 4.0')	Top of the curb ramp	R304.2.1
	Running Slope	Min 5%, Max 8.3%	Max ramp length : 15.0'	R304.2.2
	Turning Space Running Slope	Max 2%		
	Flared Sides Slope	Max 10%		R304.2.3

Parallel Curb Ramp	Width	Min 4.0'		R304.5.1
	Grade breaks	Perpendicular to the direction of the ramp	Not permitted on the ramp runs, turning spaces	R304.5.2
	Cross slope	Max 2%	See PROWAG for exceptions	R304.5.3
	Counter slope	Max 5%		R304.5.4
	Turning Space	Min 4.0' by 4.0'	at the bottom of the curb ramp	R304.3.1
	Running Slope	Min 5%, Max 8.3%	Max ramp length : 15.0'	R304.3.2
	Turning Space Running Slope	Max 2%		
Blended Transition Curb Ramps	Width	Min 4.0'		R304.5.1
	Grade breaks	Perpendicular to the direction of the ramp	Not permitted on the ramp runs, turning spaces	R304.5.2
	Cross slope	Max 2%	See PROWAG for exceptions	R304.5.3
	Counter slope	Max 5%		R304.5.4
	Running slope	Max 5%		R304.4.1

Pedestrian Access – Draft PROWAG Dimensions

Transit Stops	Clear length	Min 8.0'	Perpendicular to the street	R308.1.1.1
	Clear Width	Min 5.0'	Parallel to the street	
	Grade (parallel street)	Same as the street		R308.1.1.2
	Grade (perpendicular street)	Max 2%		
	Surface	Firm, stable, slip resistant		R308.1.3.1 (R302.7)
Ramps Not Contained Within the Street or Highway (Not controlled by street grade)	Slope	Min 5%, Max 8.3%	Stairways along with ramps is desirable but not required	R407.2
	Rise	Max 2.5'		R407.5
	Width	Min 3.0' between handrails		R407.6.2
	Length	Min 5.0'		R407.6.3
	Landing	Min 5.0' by width of ramp run		R407.6
	Landing Direction Change	Min 5.0' by 5.0'		R407.6.4 (R302.7)
	Surface	Firm, stable, and slip resistant		R407.7
	Handrails	Required if rise greater than 6"		R407.8
	Edge Protection	Required 1.0' extended ramp surface beyond face of handrail on each side	Curb or barrier required on each side of ramp if greater than 4" opening at bottom	R407.9.1 and R407.9.2

Pedestrian Closures – Additional Considerations

It's all in the Details

Pedestrian Closures - Sign Placement

Pedestrian Closures – Audible Information Devices

6D.01 Pedestrian Considerations

- 11E. Blocked routes, alternate crossings, and sign and signal information should be communicated to pedestrians with visual disabilities by providing devices such as audible information devices, accessible pedestrian signals, or barriers and channelizing devices that are detectable to the pedestrians traveling with the aid of a long cane or who have low vision.

Pedestrian Closures – Audible Information Devices

Audible information devices (and all TTC devices) are only as effective as the message

Hey! Hey you!

Robert St. bridge sidewalk closed. Follow pedestrian detour.

Any issues with these two real world messages?

Pedestrian Closures- Canopied Walkway

Pedestrian Closures - Barrier Beautification

Temporary and permanent barriers/fencing provide canvases for public art

Pedestrian Closures – Winter Maintenance

Design should allow for consistent level of maintenance

Bicycle Work Zone Considerations/Accommodations

How do we safely accommodate cyclists with a minimum of disruption?

Bicycle Closure - MUTCD

MUTCD does not provide specific direction or Typical Application Sheets for Bicycle Facility Work Zone Accommodations

6G.05 Work Affecting Pedestrian and Bicycle Facilities

- 01 It is not uncommon, particularly in urban areas, that road work and the associated TTC will affect existing pedestrian or bicycle facilities. It is essential that the needs of all road users, including pedestrians with disabilities, are considered in TTC zones.

- 03 Where pedestrian or bicycle usage is high, the typical applications should be modified by giving particular attention to the provisions set forth in Chapter 6D, this Chapter, Section 6F.74, and in other Sections of Part 6 related to accessibility and detectability provisions in TTC zones.

- 04 Pedestrians should be separated from the worksite by appropriate devices that maintain the accessibility and detectability for pedestrians with disabilities.

- 05 Bicyclists and pedestrians should not be exposed to unprotected excavations, open utility access, overhanging equipment, or other such conditions.

Bicycle Closure – Principles and Best Practices

- Context Matters
  - Urban vs. Rural
  - Everyday cyclists vs. recreational cyclists
  - Road Surface, Grade, Auto Traffic Volumes and Speed

Bicycle Closure – Principles and Best Practices

- Maintaining the existing facility or providing an equivalent temporary facility is best
  - Remove parking or redundant traffic lanes before downgrading bicycle facility quality
  - Don’t require dismounting by cyclists!

Bicycle Closure – Principles and Best Practices

- Observe existing facilities at multiple times of day to understand local conditions
- Link Ped/Bike TTC plans and execution to road work permits and enforce!
- Go beyond the guidelines: field trainings for state/city/private contractors

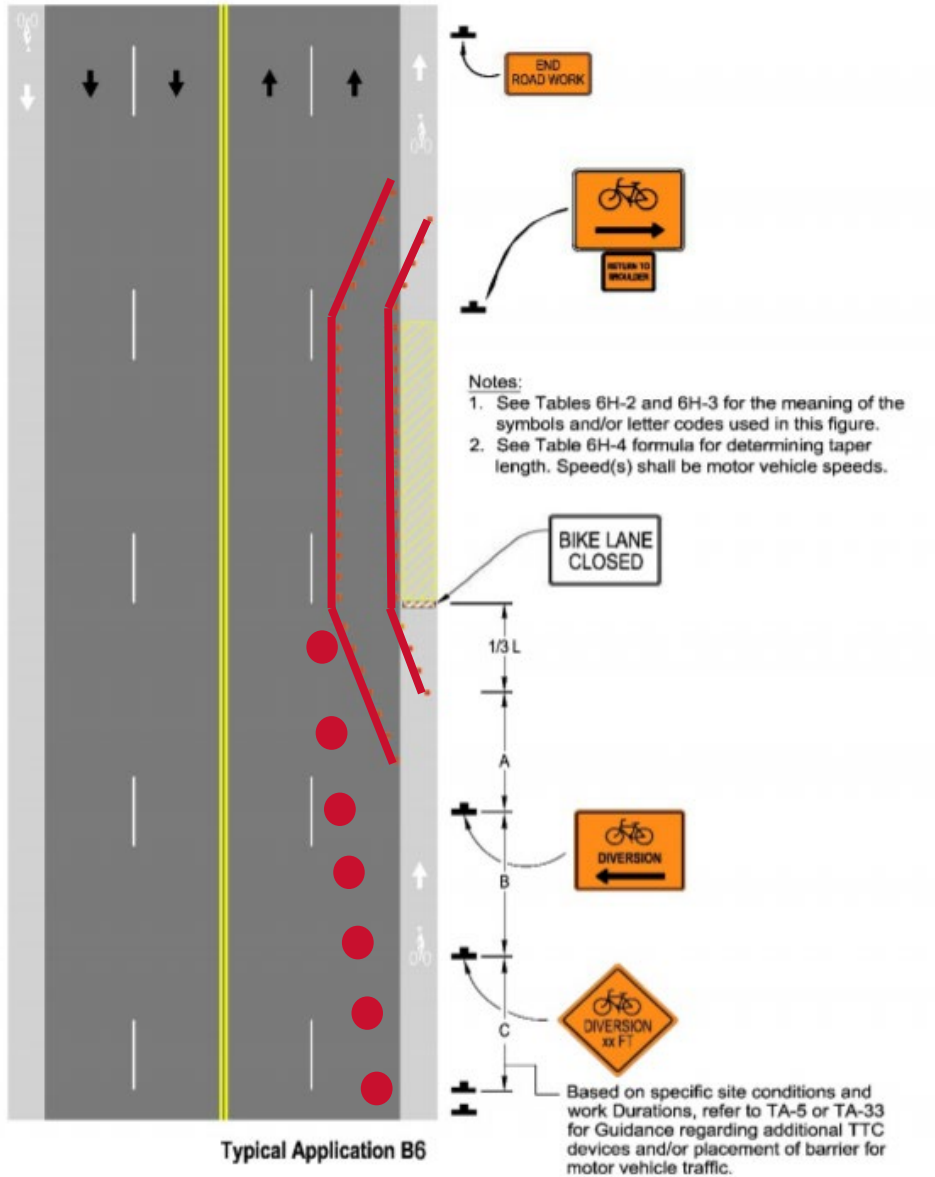
Bicycle Closure - Sign Placement

6F.03 Sign Placement

08. Neither portable nor permanent sign supports should be located on sidewalks, bicycle facilities, or areas designated for pedestrian or bicycle traffic.

Bicycle Closure – Rural/Recreational Cycle Routes

- Roadway speed and traffic volume are critical to safety of a temporary shared roadway treatment
  - Where possible, separate facilities are preferred
- Separate bicycle and auto traffic on high speed/volume roadways
  - Channelization and Barriers to provide protection and separation

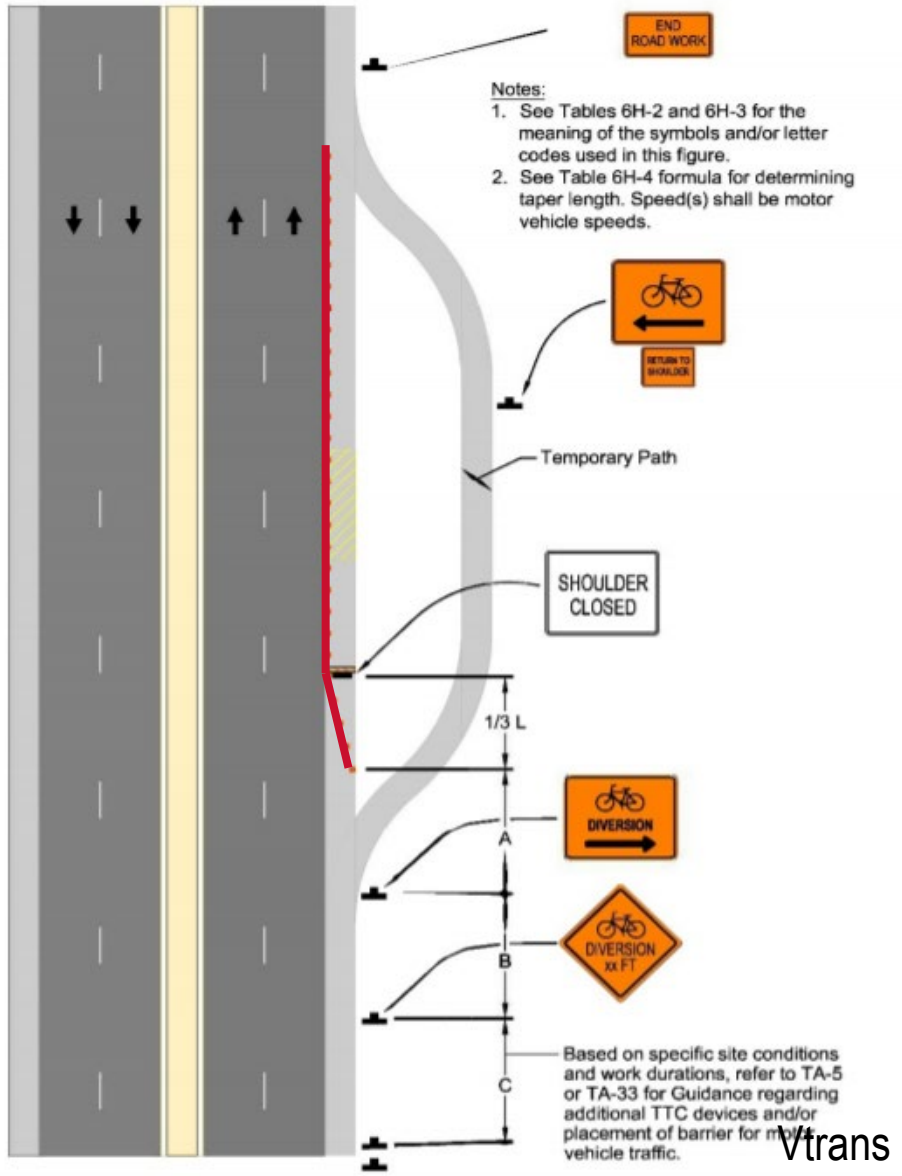


Typical Application B6

Bicycle Closure – Rural/Recreational Cycle Routes

- If on-roadway separation is infeasible on high speed/volume roadways, consider off-roadway temporary paths (also applies to off-road bike paths)

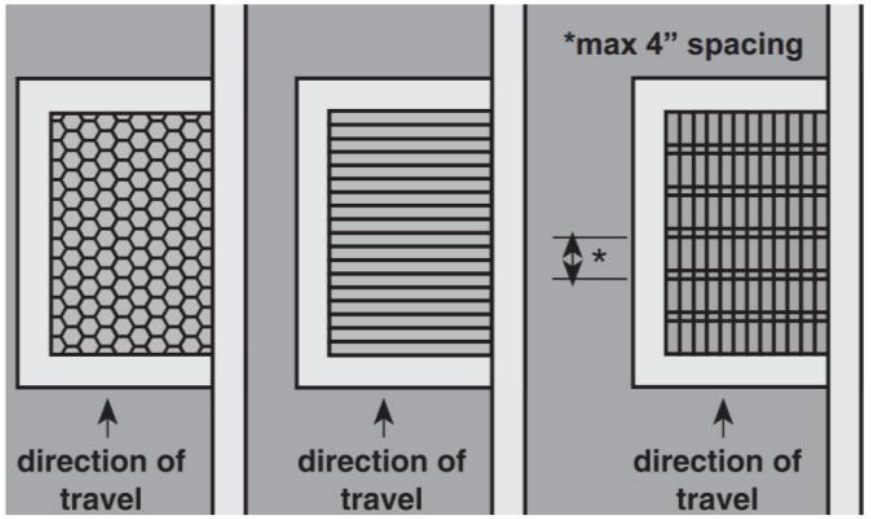
Mountain View Online



Vtrans

Bicycle Closure – Rural/Recreational Cycle Routes

- Flaggers: for alternating one-way operation on shared roadway, process vehicle queue and then bicycle queue separately to maintain separation of users
- Where necessary for safety reasons (high volume/speed roadways with no room for separate facility) bicycle detours may be necessary
  - Detour route should consider length, grade, shoulder width and surface condition (grates, surface type, etc.)



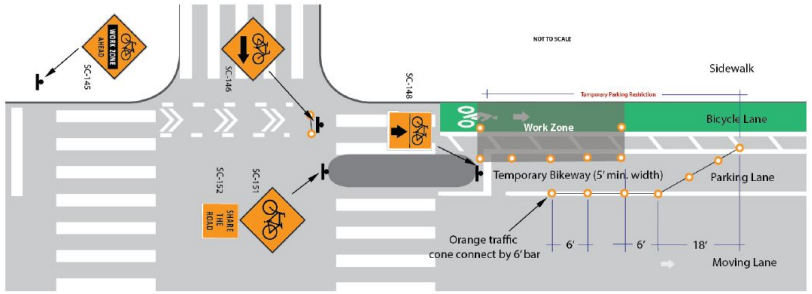
Bicycle Safe Grates

Bicycle Closure – Urban Context

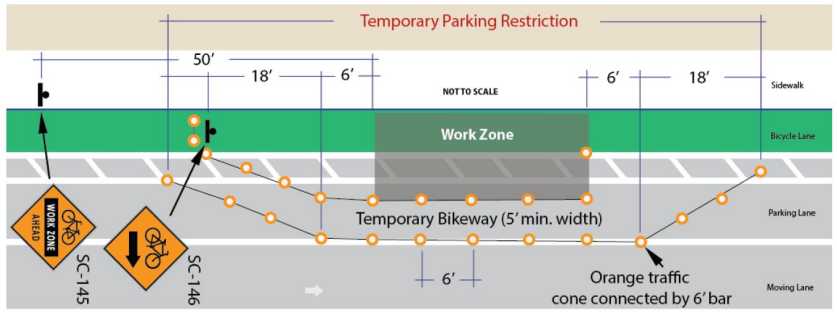
Selection of TTC scheme dependent on type of facility, duration and work to be performed

Protected Bike Lane to Temporary Bikeway – Short Term (NYCDOT)

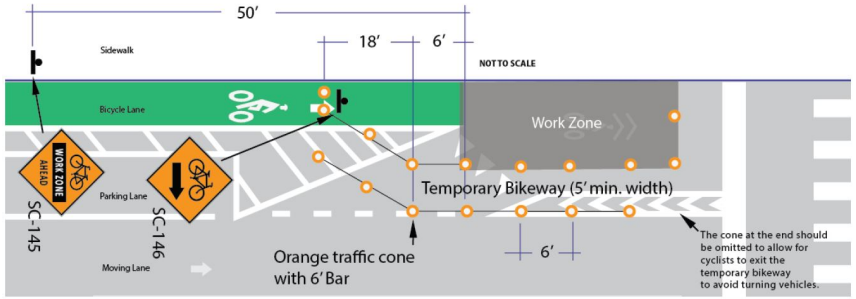
Block Start



Mid-Block

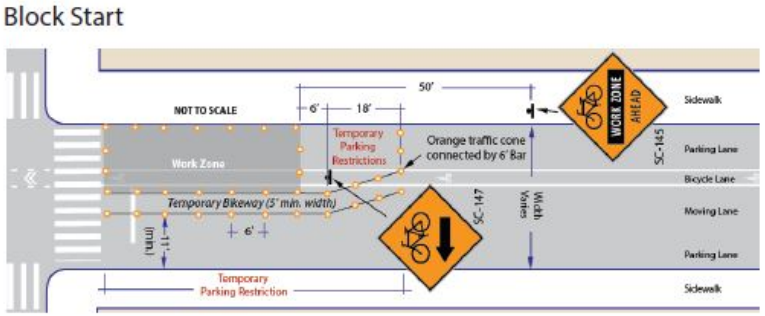


Block End



Bike Lane to Temporary Bikeway – Short Term (NYCDOT)

Block Start



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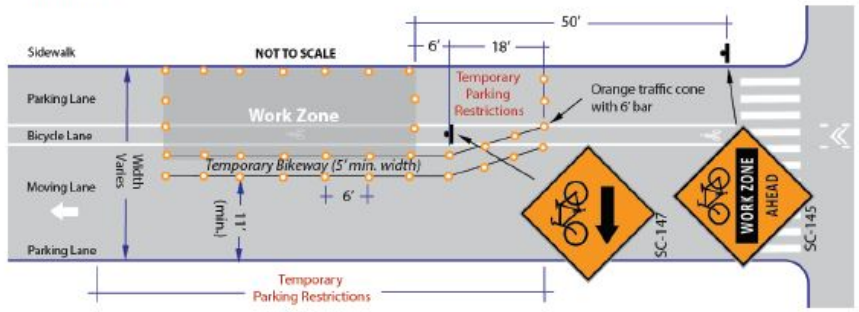

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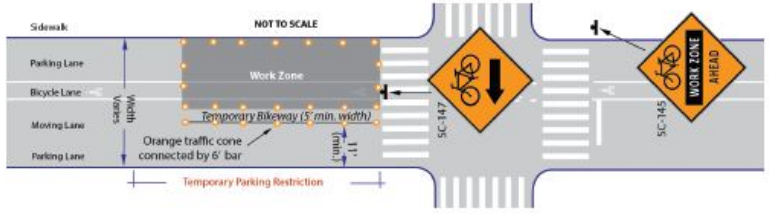
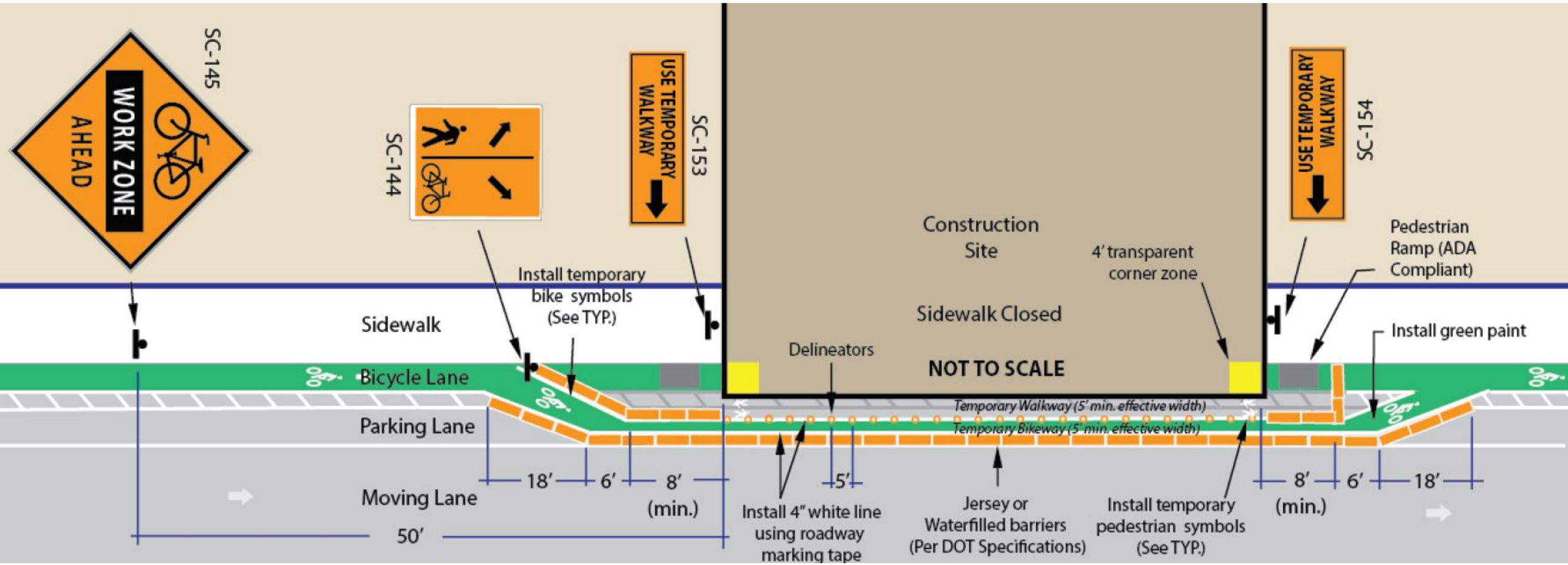


Bicycle Closure – Urban Context

Long Term projects should match the existing facility as well as possible, including through use of semi-permanent pavement markings and removal of non-applicable markings

Protected Bike Lane and Walkway Rerouted to Parking Lane – Long Term (NYCDOT)



Bicycle Closure – Urban Context

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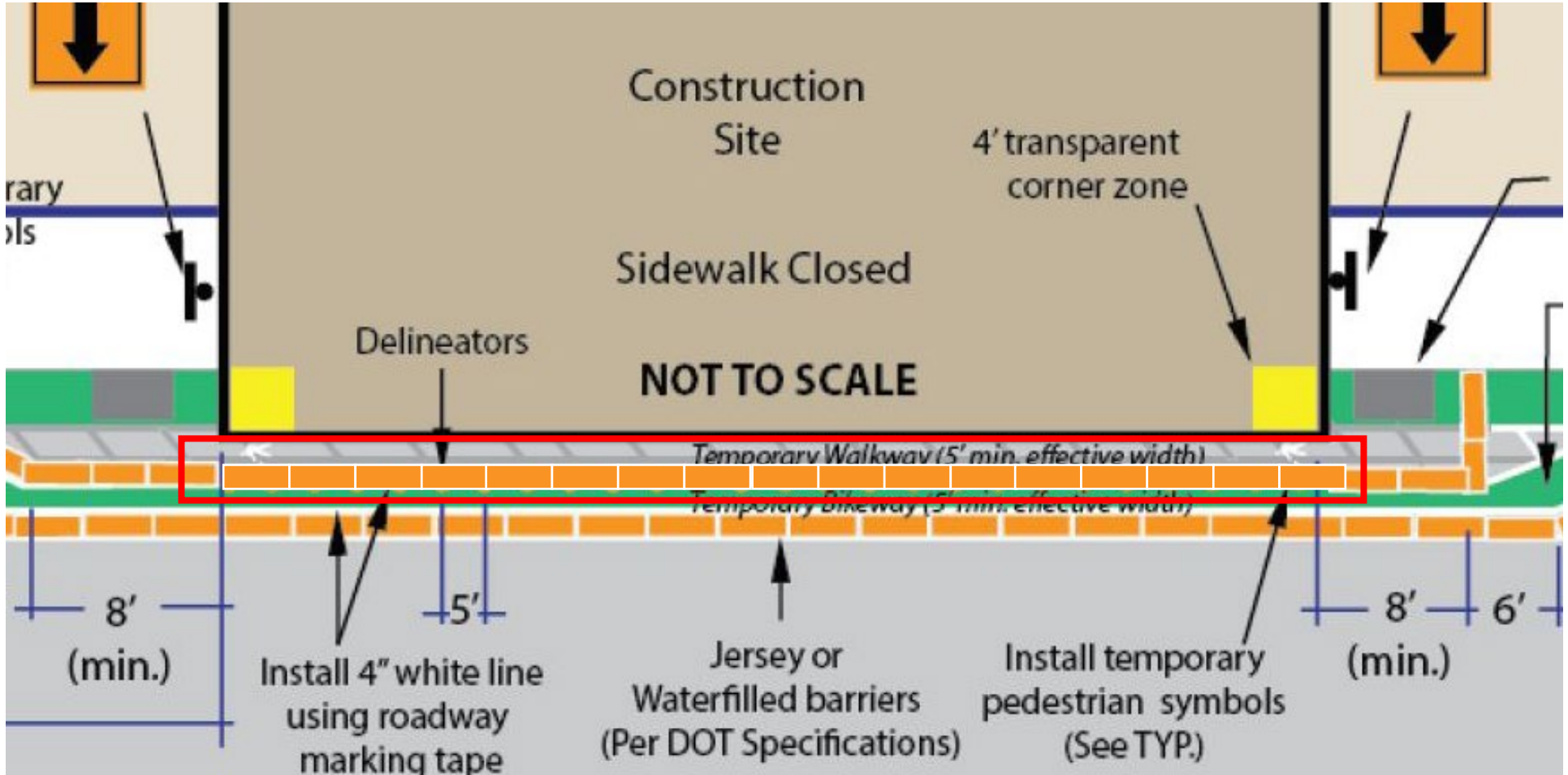


Bicycle Closure – Maintaining Quality of Facility

Quiz Time

Quiz Time

Transit Considerations

- Where work zones block or impede transit access:
  - Provide temporary facilities, or,
  - Work with transit operator to relocate stop outside of work zone

Transit Considerations

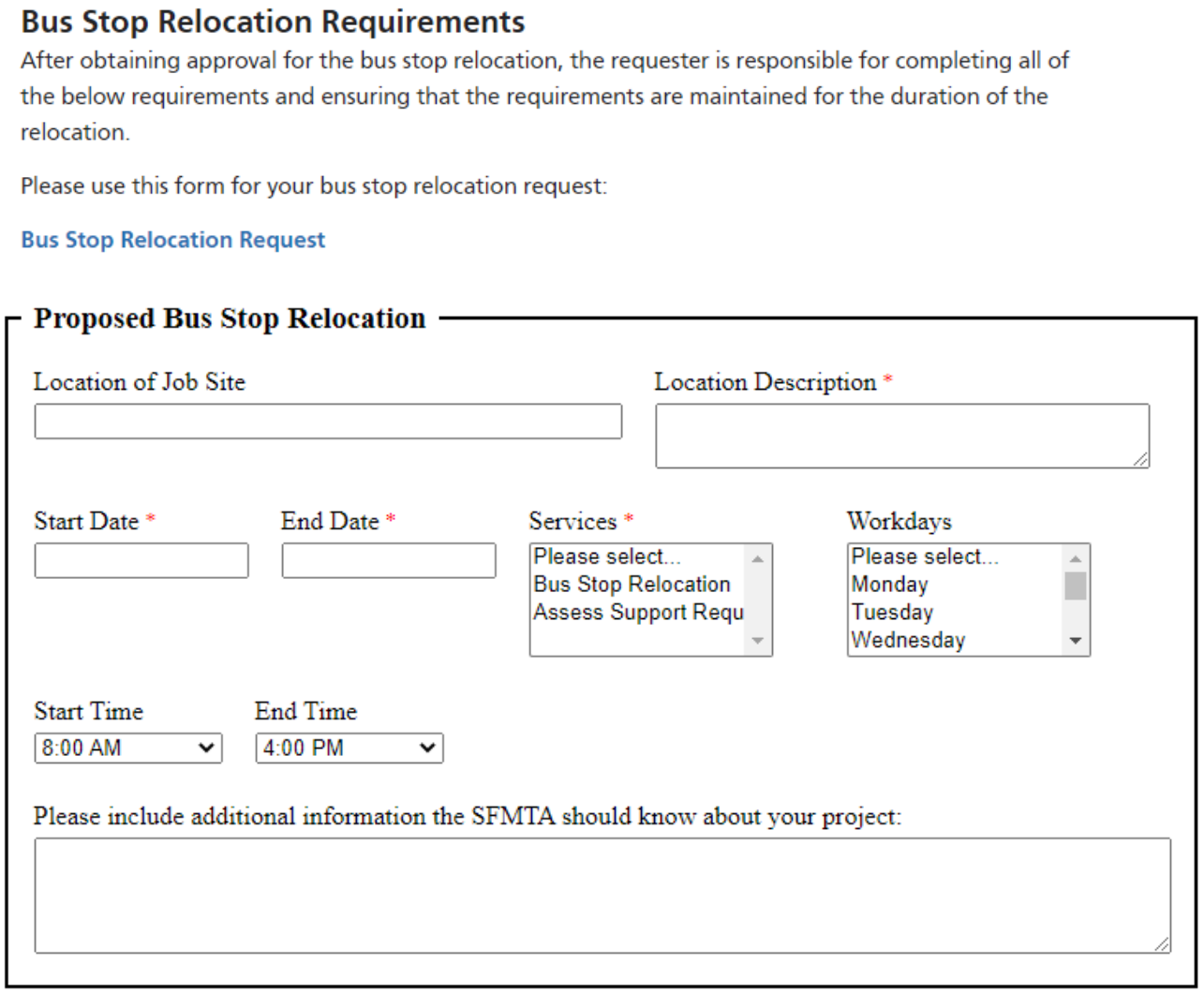
- Temporary or relocated transit stops must be part of broader pedestrian accommodations
- Temporary stops should have:
  - Ample loading/unloading space
  - Sufficient safe space to wait
  - Accessible sidewalk to/from the stop

Transit Considerations

- Provide wayfinding between closed and relocated stops
- If transit routes or portions of routes are to be detoured, sufficient notice should be given to riders through posted signs as well as through transit agency communications

Transit Considerations

- Close coordination with Transit Agencies is key, and each agency has their own procedures



Bus Stop Relocation Requirements

After obtaining approval for the bus stop relocation, the requester is responsible for completing all of the below requirements and ensuring that the requirements are maintained for the duration of the relocation.

Please use this form for your bus stop relocation request:

Bus Stop Relocation Request

Proposed Bus Stop Relocation

Location of Job Site

Location Description *

Start Date *

End Date *

Services *

Please select...
Bus Stop Relocation
Assess Support Requ

Workdays

Please select...
Monday
Tuesday
Wednesday

Start Time

8:00 AM

End Time

4:00 PM

Please include additional information the SFMTA should know about your project:

SFMTA Bus Stop Relocation Webform

QUESTIONS

For additional information, contact:

Rick Plenge

Rick.Plenge@hdrinc.com | (617) 357-7741