

Improving Pedestrian and Bicyclist Safety in Work Zones



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December 4, 2019



Housekeeping

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- ⇒ Copy of presentations
- ⇒ Recording (within 1-2 days)
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- ⇒ Information about webinar archive



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The screenshot shows the 'Webinars' section of the Pedestrian and Bicycle Information Center website. The header includes the PBIC logo and navigation links: Data & Resources, Community Support, Planning & Design, Training & Events, and Programs & Campaigns. The main content area is titled 'Webinars' and features a list of upcoming and recent webinars. The first webinar listed is 'Road Users: Increasing Safety for All Road Users' (BILCSM11 Webinar) presented by Keith Hines, Steve STAF, and Brian Chandler, Latham. The second is 'Bicycle Safety Guide and Countermeasures Detection Systems' presented by Tamara Robinson, FHWA Office of Safety, Carl Gustafson, SNC Highway Safety Research Center, Dan Nohari, Vanessa Hagan-Martin, Inc., and Peter Lagorway, Trade Design Group. The third is 'A Resident's Guide for Creating Safer Communities for Walking and Biking' presented by Tamara Robinson, FHWA, Loree Sand, PBIC, Eva Garcia, City of Brownsville, Texas, Warren Gonzalez, City of Brownsville, Texas, and John Paul Mofler, Livable Municipalities. The fourth is 'Active Team Safety Tool: A Model Methodology for Prioritizing Pedestrian and Bicycle Improvements on Existing Roads'.



The screenshot shows the Facebook page for the Pedestrian and Bicycle Information Center. The header includes the PBIC logo and the text 'Pedestrian and Bicycle Information Center Government Organization' with the website URL www.pedbikeinfo.org. The page has 2,226 likes and a 'Find New Customers' button. The main content area features a post from the PBIC page with the text: 'Our Webinars at the National Center for Safe Routes to School are offering a free webinar on how their activities support Leaders of Opportunity.' Below the text is a map of the United States and a link to 'Safe Routes to School activities in support of Leaders of Opportunity - BIC and State program...'. The footer of the page includes the text: 'Your potential to improve the quality of life in communities through the increase in safe walking and bicycling is a viable means of transportation.' and 'SAFE ROUTES TO SCHOOL'.



Discussion

⇒ **Send us your questions** 

⇒ **Follow up with us:**

⇒ Martha Kapitanov martha.kapitanov@dot.gov

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⇒ Melissa Anderson anderson@engineering4access.com

⇒ Matthew Marcou matthew.marcou@dc.gov

⇒ General Inquiries pbic@pedbikeinfo.org

⇒ **Archive at www.pedbikeinfo.org/webinars**





U.S. Department of Transportation
Federal Highway Administration



Work Zones

FHWA Perspective

December 04, 2019

Patrick Gomez – FHWA Resource Center

Features within the Pedestrian Access Route (PAR) include:

- **Sidewalks**
 - **Shared Use Paths**
 - **Crosswalks**
 - **Pedestrian Signals**
 - **Access to Transit Stops and Shelters**
-
- **Location on the same side of roadway as the closed route is desirable**

R205 Alternate Pedestrian Access Route

Alternate Pedestrian Access Route is required when an existing pedestrian circulation path is temporarily closed by construction, alteration, maintenance, or other condition.

- Do not use cones and tape
- Do not place display signs on the sidewalk blocking the walkway

R302 Alternate Pedestrian Access Route

Alternate pedestrian access routes shall comply with Section R302 (among other things) of the PROWAG.

R302 specifies that the alternate circulation path shall be:

- Provided on the same side of the street as the disrupted route, to the maximum extent feasible
- Where exposed to adjacent construction, traffic or other hazards, shall be protected with a pedestrian barricade or channelization device
 - -Continuous, stable, non-flexible
 - -Consist of features identified in the MUTCD Chapter 6F

R205 Alternate Pedestrian Access Route

Alternate pedestrian access routes shall comply with MUTCD 6D.01, 6D.02 & 6G.05:

- -Advance notice of sidewalk closures required
- -Alt route shall be as detectable and accessible as the closed facility
- -Temporary facilities shall be detectable

Where provided, pedestrian barricades & channelizing devices shall comply with MUTCD 6F.63, 6F.68 & 6F.71, including:

- -Channelizing devices shall be detectable by cane, with continuous bottom & top surfaces
- -Longitudinal channelizing devices shall be interlocked (no gaps)

Alternate Pedestrian Access Routes

Section R302 of PROWAG

Alternate routes should:

- Be located on same side of street if possible
- Provide smooth, continuous hard surface
- No curbs or abrupt changes in grade/terrain
- Provide access to temporary transit stops
- Maintain existing width (or 60" min) & limit protrusions
- Work zone communications should be audible and/or detectable
- Separate pedestrians from worksite with appropriate devices that maintain accessibility
- Protect peds from excavations, equipment, etc.



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Improving Pedestrian and Bicyclist Safety in Work Zones



U.S. Department of Transportation
Federal Highway Administration

December 4, 2019



2017 Work Zone Data

| | Fatal Crashes | Fatalities | Ped-Fatal Crashes | Ped-Fatalities |
|-----------------|---------------|------------|-------------------|----------------|
| National | 710 | 799 | 129 | 126 |
| | | | | |
| State | Fatal Crashes | Fatalities | Ped-Fatal Crashes | Ped-Fatalities |
| Arizona | 14 | 15 | 0 | 0 |
| California | 46 | 48 | 11 | 10 |
| Florida | 71 | 76 | 16 | 13 |
| Georgia | 55 | 60 | 13 | 13 |
| Illinois | 21 | 27 | 2 | 2 |
| Indiana | 24 | 28 | 1 | 1 |
| Louisiana | 10 | 11 | 0 | 0 |
| Michigan | 23 | 25 | 3 | 3 |
| Missouri | 12 | 15 | 1 | 1 |
| New Jersey | 6 | 6 | 2 | 2 |
| New Mexico | 4 | 4 | 2 | 2 |
| New York | 3 | 3 | 1 | 1 |
| North Carolina | 6 | 11 | 0 | 0 |
| Pennsylvania | 19 | 20 | 3 | 3 |
| Puerto Rico | 0 | 0 | 0 | 0 |
| Tennessee | 10 | 20 | 3 | 2 |
| Texas | 143 | 144 | 26 | 30 |

Source: NHTSA, 2017 FARS



Key Work Zones Regulations

- Work Zone Safety and Mobility Rule (23 CFR 630 Subpart J)
- Temporary Traffic Control Devices Rule (23 CFR 630 Subpart K)
 - http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm
- Manual on Uniform Traffic Control Devices (MUTCD)
 - Including high-visibility apparel
 - <http://mutcd.fhwa.dot.gov/>
- Crashworthiness of Work Zone Temporary Traffic Control Devices
 - National Cooperative Highway Research Program (NCHRP) 350 and Manual for Assessing Safety Hardware (MASH)
 - <http://safety.fhwa.dot.gov/>



MUTCD-Part 6 Typical Applications

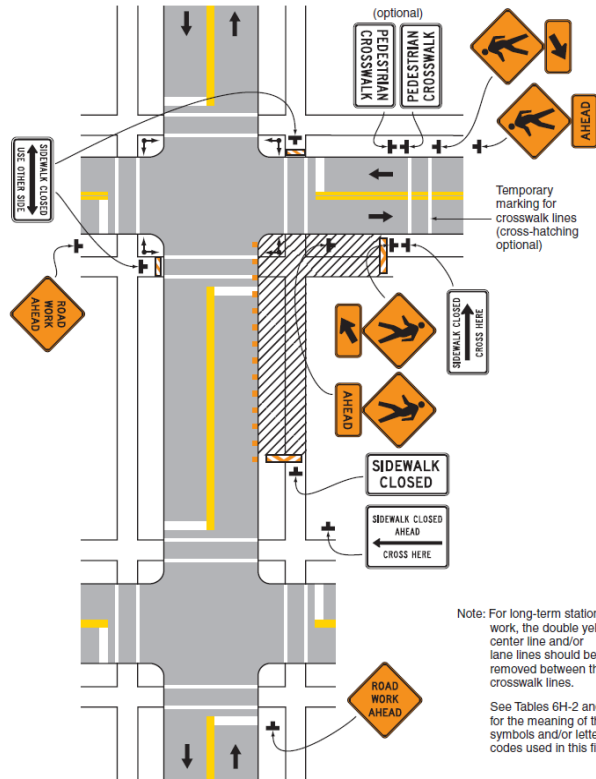


Figure 6F-5. Exit Open and Closed and Detour Signs



Source: 2009 MUTCD

Source: 2009 MUTCD-Typical Applications 46



Guidelines for Work Zone Designers-Pedestrian and Bicycle Accommodation -University of Wisconsin, Madison

- Pedestrian & bicycle accommodation guidelines for designers
 - Design elements/principles
 - Common problems – possible solutions
 - Temporary surfacing options
 - Staging
- https://www.workzonesafety.org/files/documents/training/fhwa_wz_grant/uw_wz_designer_guidelines_pedestrian_bicycle_accommodation-508.pdf



Loss of Access to Bus Stops

Problem



Possible Solution

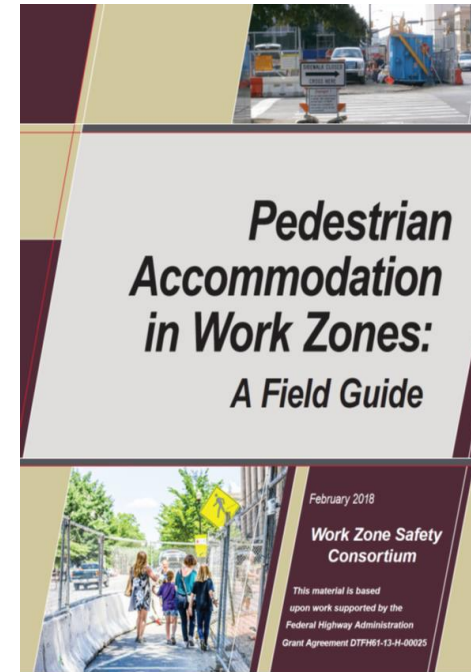


Source: UW-M TOPS Lab



Pedestrian Accommodation in Work Zones: A Field Guide

- Available under the “Accommodating Pedestrians” hot topics page or the “FHWA Work Zone Safety Grants” training database on the National Work Zone Safety Information Clearinghouse
- https://www.workzonesafety.org/files/documents/training/fhwa_wz_grant/artba_pedestrian_accommodation_wz.pdf



Source: ARTBA



Working Near a Sidewalk

Avoid or remove obstacles on sidewalks and paths



Source: ARTBA

American Traffic Safety Services Association (ATSSA) Training

- Temporary Traffic Control Considerations for Urban Work Zones Training Course (2 days)
 - Discusses the basic TTC standards and guidelines and provides guidance to implement/apply them in an urban environment!



Source: ATSSA



ATSSA Training

- Designing Temporary Traffic Control (TTC) Zones for Pedestrian Accessibility (1 day)
 - Identifies some of the challenges faced by persons with disabilities within the Public Right-of-Way.
 - Discusses the application of laws and regulations in TTC zones

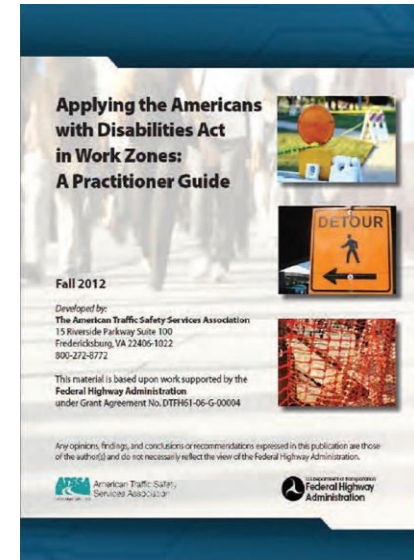
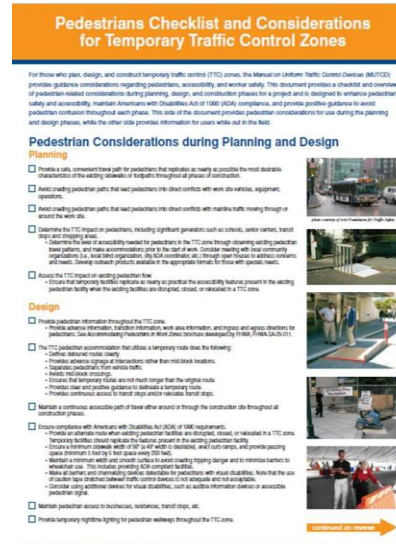


Source: ATSSA



Additional Resources: Checklist and Guide (ATSSA)

- Pedestrians Checklist and Considerations for TTC Zones
 - Also available in Spanish



www.workzonesafety.org/training-resources/fhwa_wz_grant/atssa_pedestrian_checklist/



Resources

- FHWA Federal-aid Essentials for Local Public Agencies
 - <https://www.fhwa.dot.gov/federal-aidessentials/>
- FHWA Work Zone Management
 - <https://ops.fhwa.dot.gov/wz/index.asp>
- National Work Zone Safety Information Clearinghouse
 - <https://www.workzonesafety.org/>
 - https://www.workzonesafety.org/work_zone_topics/pedestrian-safety/
- American Traffic Safety Services Association (ATSSA)
 - <https://www.atssa.com/Training/Work-Zone-Safety-Grant>



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Work Zone Access for Pedestrians with Disabilities

Melissa Anderson, PE
Engineering4Access

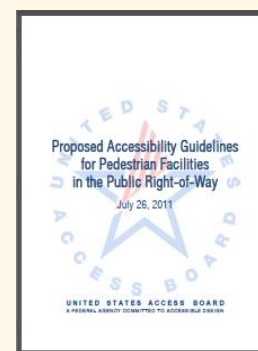
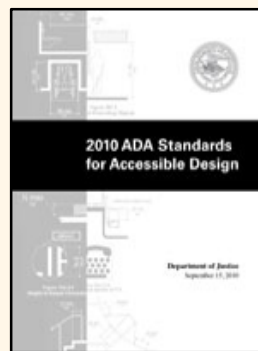
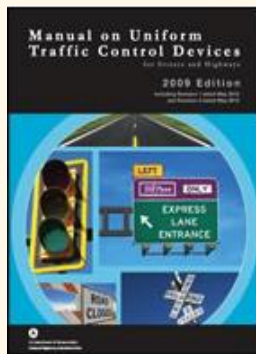
Transportation Access is a Civil Right



“...accessible to, and usable by, people with disabilities.”

Resources for Accessible Work Zones

- Manual on Uniform Traffic Control Devices
- 2010 ADA Standards (curb ramps)
- Proposed Public Right of Way Accessibility Guidelines
 - Requires an alternate pedestrian access route complying with sections 6D.01, 6D.02, and 6G.05 of the MUTCD
 - Where provided, pedestrian barricades and channelizing devices shall comply with sections 6F.63, 6F.68, and 6F.71 of the MUTCD



Pedestrian Access Routes

- Surface – firm, stable, slip resistant
- Continuous clear width – 48 inches min., 60 inch passing
- Running slope – Street grade, 5% at street crossing
- Cross slope – 2% max., street grade at mid-block crossing
- Vertical alignment – $\frac{1}{4}$ inch vertical, $\frac{1}{2}$ inch beveled max.
- Openings – $\frac{1}{2}$ inch max. in the direction of travel
- Protruding objects – 4 inch max. in the circulation path
- Curb ramps – 8.3% grade, 2% cross slope, 4 ft. wide
- Ramps – add edge protection and handrails, as required

Why Does it Matter??

Disability Awareness

How Many People are We Talking About?

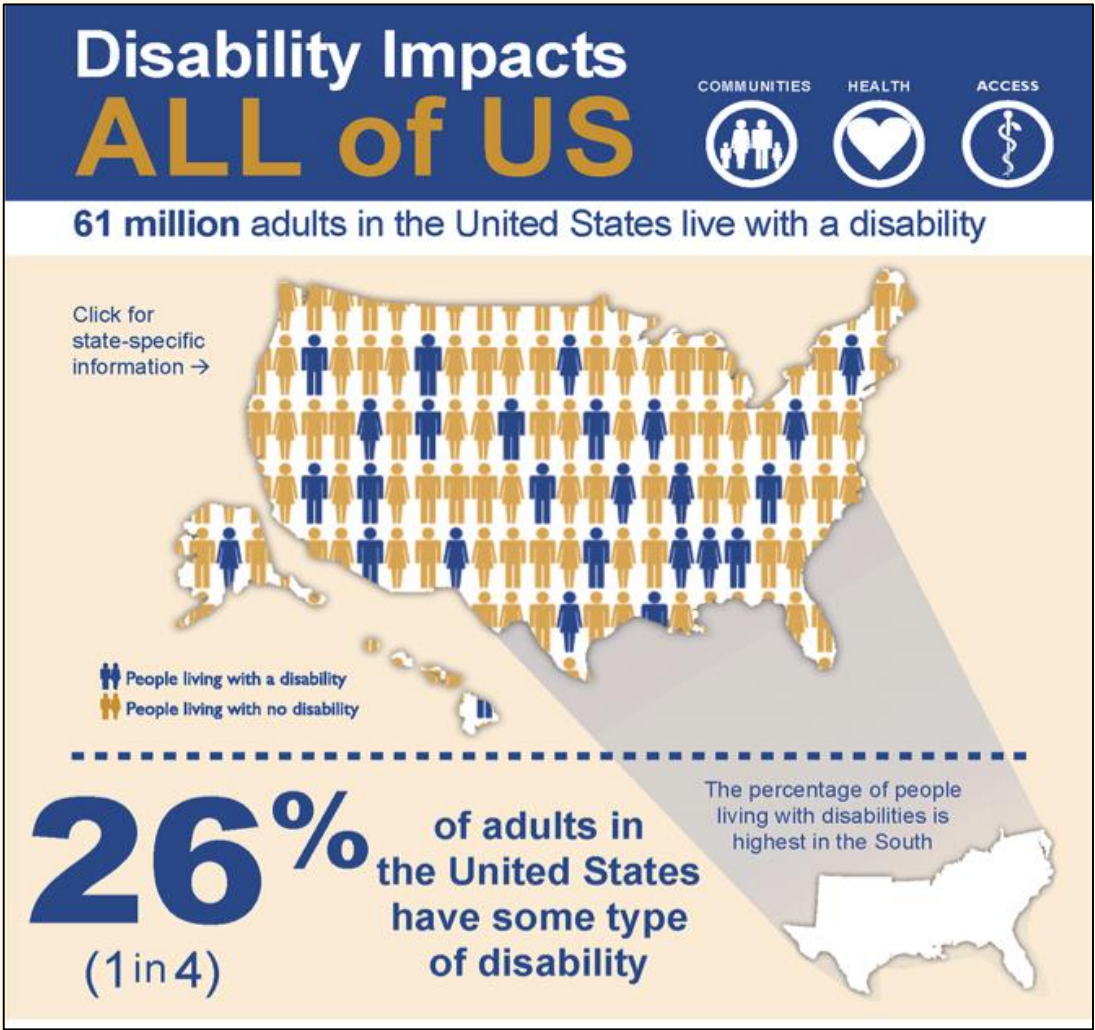


Image from the Centers for Disease Control

What Types of Disabilities?

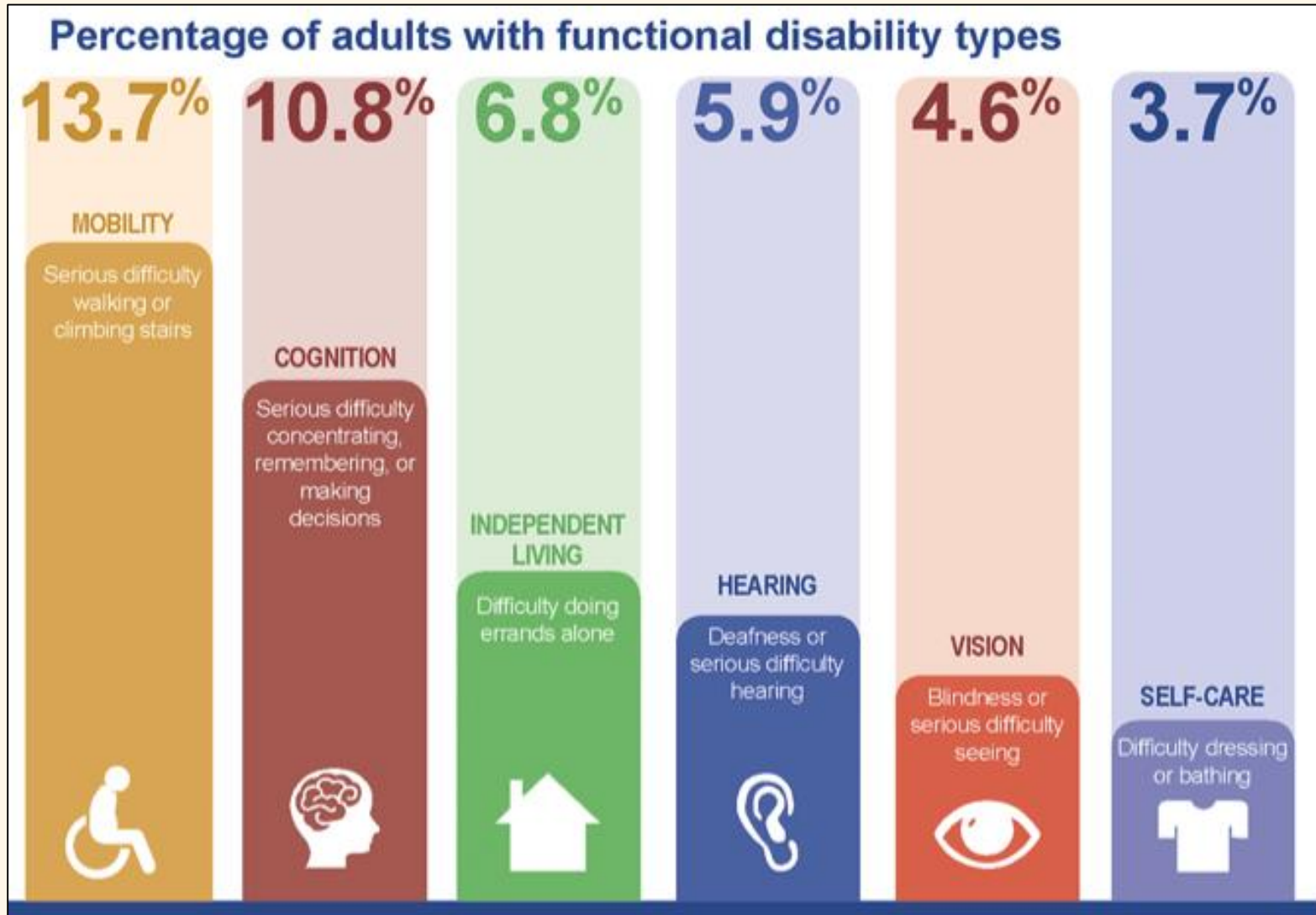
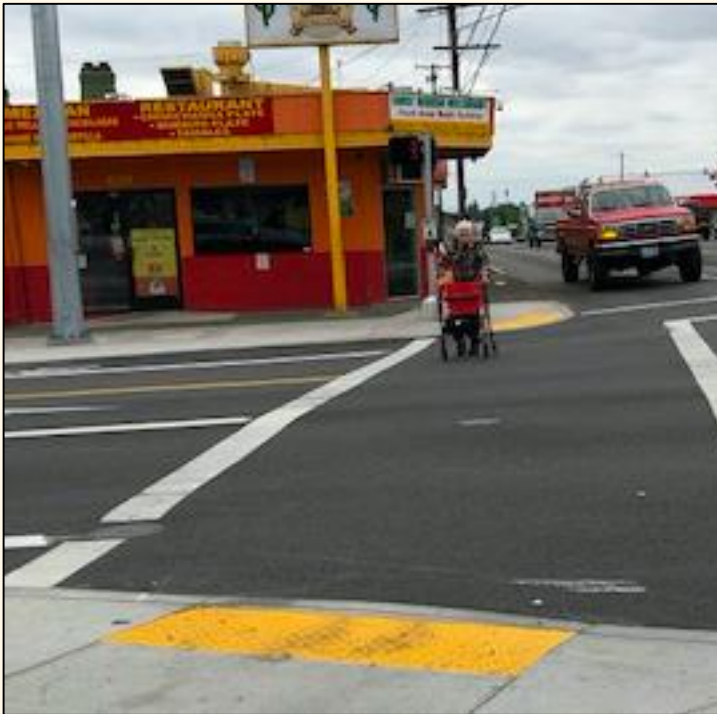


Image from the Centers for Disease Control

Mobility Disability (13.7%)

- Person may have trouble walking, or climbing stairs
- Person may use a wheelchair, walker, cane, crutches, or have a shuffling gait, easily fatigued

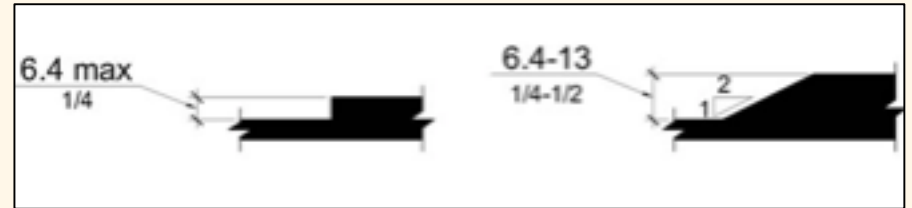


Common Problems for Mobility Access



Continuous Route and Clear Width

Common Problems for Mobility Access



Surfaces and Level Changes

Common Problems for Mobility Access



Curbs and Elevation Changes

Cognitive Disability (10.8%)

- Person may have trouble evaluating a situation
- Person may have trouble concentrating, remembering or making decisions
- Person may make notes or ask for information again

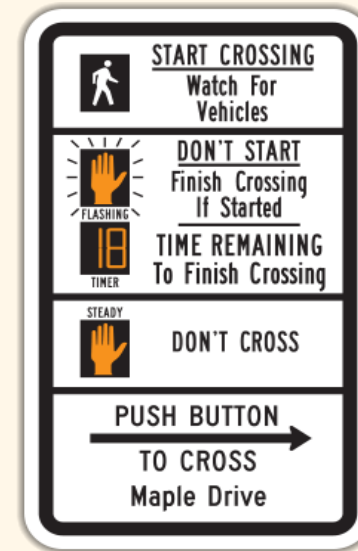
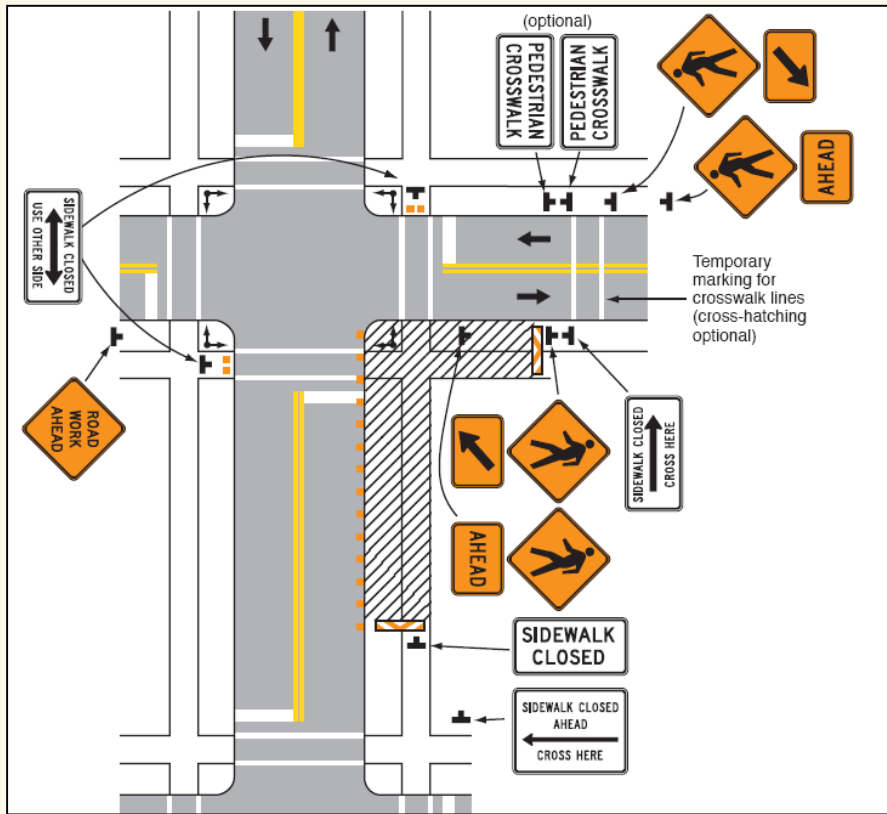


Considerations for Cognitive Disabilities



Clear Wayfinding

Considerations for Cognitive Disabilities



Simple Messaging

Hearing Disability (5.9%)

- Person may have deafness or serious difficulty hearing
- Person may use sign language, read lips

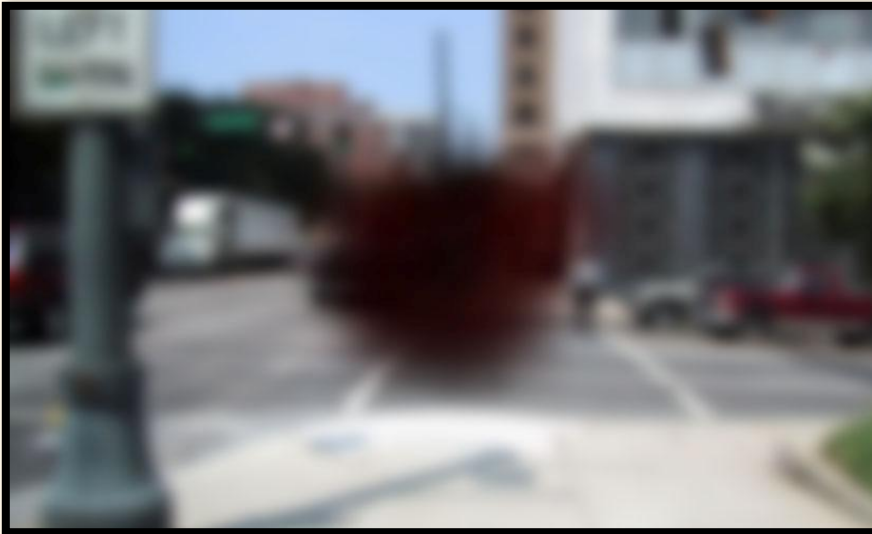
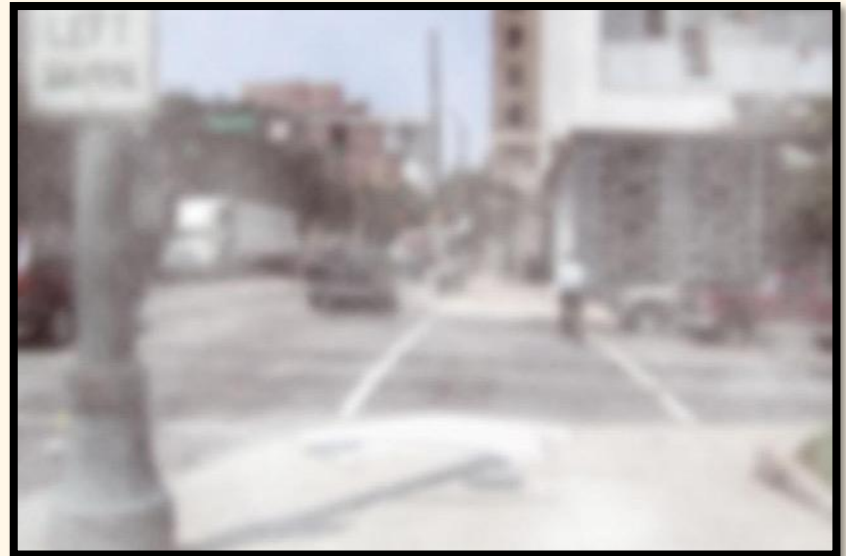


Vision Disability (4.6%)

- Person may be blind or have a decreased level of vision
- Person may use a white cane, guide dog or nothing



Types of Vision Loss?



Images from the Accessible Design for the Blind

Common Problems for People with Vision Loss



Wayfinding

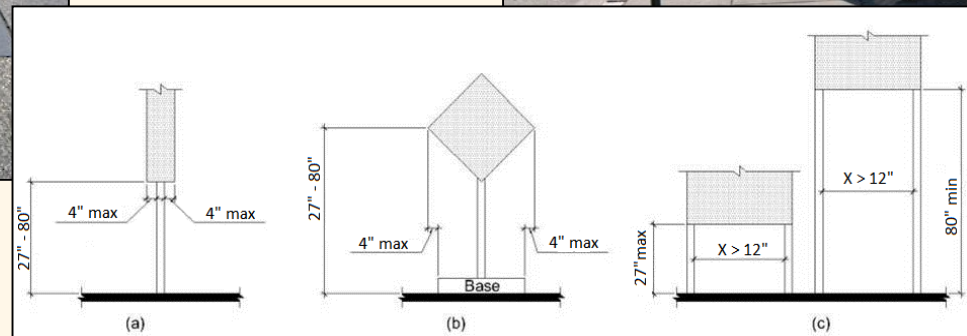


Common Problems for People with Vision Loss



Barriers and Pedestrian Protection

Common Problems for People with Vision Loss



Protruding Objects

Best Practices to Improve Access in Work Zones

- Design Phase
 - Pedestrian traffic control plans based on project needs
- Pre-construction meetings
 - Emphasize phasing for continuous access
 - Review access requirements and traffic control plan
 - Review equipment and material requirements
- Construction
 - Public Notice includes pedestrian impacts
 - Daily review of pedestrian routes and detours from the perspective of users with disabilities
 - Employee training on interactions with pedestrians

Thank you.



Melissa Anderson
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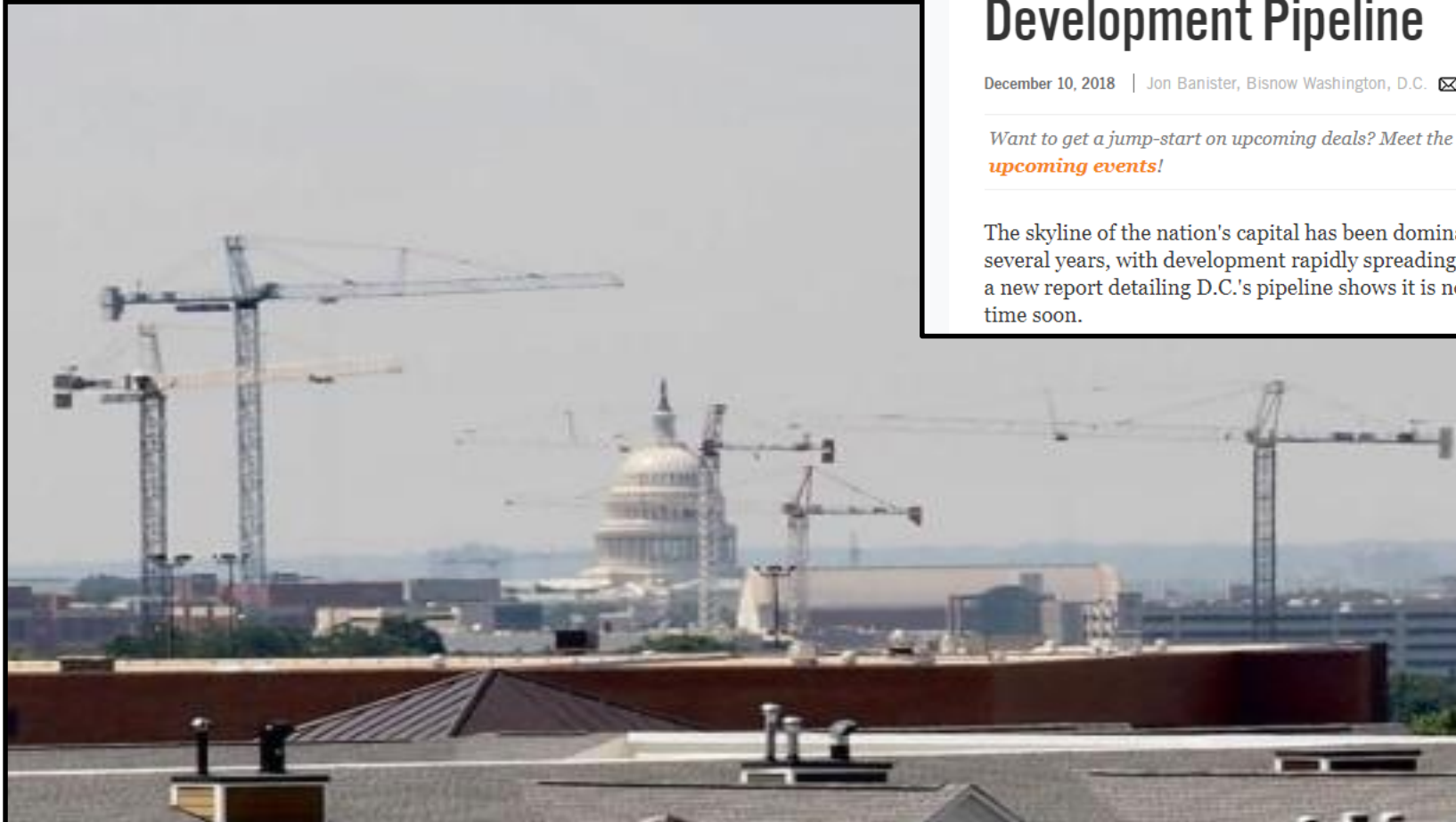
Pedestrian and Cyclist Accommodation in Work Zones in Washington, DC

Presentation by Matthew J Marcou
Associate Director, Public Space Regulation Division
District Department of Transportation



Improving Pedestrian and Bicyclist Safety in Work Zones
UNC Highway Safety Research Center
12/05/2019

The Challenge of Success



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Washington DC Economic Development

Breaking Down D.C.'s \$50B Development Pipeline

December 10, 2018 | Jon Banister, Bisnow Washington, D.C. ✉

*Want to get a jump-start on upcoming deals? Meet the major D.C. players at **one of our upcoming events!***

The skyline of the nation's capital has been dominated by cranes for the last several years, with development rapidly spreading to new parts of the District, and a new report detailing D.C.'s pipeline shows it is not expected to slow down any time soon.

Background/History

In the early 2000s, it was typical for sidewalks to be closed for 18-24 months!



The MUTCD warns about what happens in these situations:

“It must be recognized that pedestrians are reluctant to retrace their steps to a prior intersection for a crossing or to add distance or out-of-the-way travel to a destination.” – Chapter 6D

First Steps: Pedestrian Safety

A new way: Pedestrian Safety & Work Zone Standards Adopted in 2007; Departmental Order, 2010



PEDESTRIAN SAFETY AND WORK ZONE STANDARDS

Covered and Open Walkways



- Spells Out Preferred Methods for Routing Pedestrians Safely Through Work Zones Occupying Public Space
- 4 Basic options to accommodate pedestrians:
 - Covered on the sidewalk
 - Covered in the roadway
 - Open on the sidewalk
 - Open in the roadway
- Developed Cooperatively
 - DDOT Team and Developers at the table
 - Collaboration over 4 months
 - Once a policy was set it wasn't revisited
 - Established a phase in period (+/- 4 months)

One Size Doesn't Fit All

Pedestrian Protection by Phase of Construction

| Phase of Construction | Pedestrian Protection | | | | |
|--------------------------------------|----------------------------|---------------------------|-------------------------|------------------------|------------------|
| | Covered Walkway -Sidewalk- | Covered Walkway -Roadway- | Open Walkway -Sidewalk- | Open Walkway -Roadway- | Sidewalk Closure |
| Raze | | | | | P |
| Facade Demolition | 2† | 2† | | | P |
| Sheeting & Shoring & Excavation | P* | 2* | P* | 2* | |
| Concrete or Steel Frame Construction | | P | | | 2 |
| Skin or Façade Construction | | P | | | 2 |
| Post Skin | P | | P | 2 | |
| Sidewalk and Streetscape Work | | | | P** | 2** |
| Utility Work or other Work in ROW | | | | P** | 2** |

P = DDOT preferred method
2 = Next alternative
 * For intermittent closures due to lifting overhead, a flagger should be used at both ends of the walkway
 ** These closures are expected to last no longer than 4 to 8 weeks
 † When minimal overhead danger is present, covered walkways are the preferred method

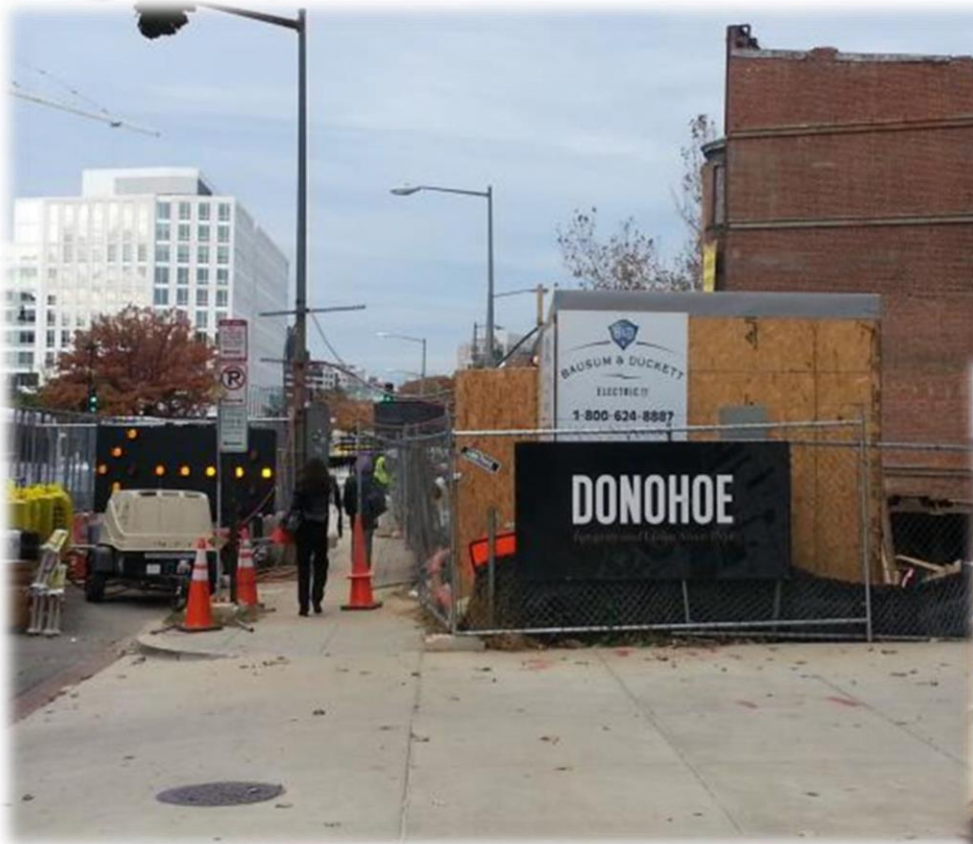
- Closing a sidewalk *is not* the same as shifting traffic
- Closing a sidewalk *is* the same as a detour
- Closures only preferred during raze/demo
- Parking should be removed to accommodate peds
- Including removing parking on both sides of the road

Safe Pedestrian Accommodation Example



- Pedestrians Conveniently Routed
- Protected from Traffic & Construction
- ADA Compliant
- Covered Route is Lighted

Pedestrian Access During Excavation & Sheeting/Shorting Phases



Sidewalk Remained Open...



...During Excavation

Safe Accommodations Act, 2014

The Washington Post
Democracy Dies in Darkness

New D.C. rules: Clear paths for pedestrians and cyclists in work zones

- “The blockage of a sidewalk, bicycle lane, or other public bicycle path shall be treated in the same manner as the closure of a lane of motor vehicle traffic by applying similar temporary traffic control practices as would be applied to the closure of a lane of motor vehicle traffic...”
- “...Equal to the safety of the route provided to pedestrians and bicyclists before the blockage of the sidewalk, bicycle lane, or other public bicycle path.”
- “...Maintained free of obstructions and surface hazards, such as construction equipment, construction materials, debris, mud, loose gravel and uneven surfaces.”

The Best Pedestrian Accommodation is Convenient for Pedestrians to Use

1. An open or covered walkway on the sidewalk or roadway is most convenient and always preferred when feasible and safe, as determined by DDOT.
2. A sidewalk closure with detour route signage posted at the crosswalks directing pedestrians to an ADA-compliant route on the opposite side of street may be approved **only as a last resort**, if:
 - ✓ Route on the same side of street is infeasible or impractical as determined by DDOT, and closure is for no more than 4 to 8 weeks; or
 - ✓ Safety conditions at the work site, as determined by DDOT, but the sidewalk closure time is limited to no longer than the unsafe condition causing the sidewalk closure exists.

Safe Accommodation Act

The Final Rule also states:

- “Routing priority; provided that closing a sidewalk and **routing pedestrians to the sidewalk on the opposite side of the street shall only be approved as a last resort** for the duration of time needed to assure pedestrian safety in the absence of other practicable routing options;”
- Can set up a competition between bicycle facilities and the pedestrian facilities.
 - **Closing the adjacent motor vehicle travel lane to provide space for a bicycle lane**; provided that a minimum of one (1) motor vehicle travel lane shall remain in the same direction of travel;

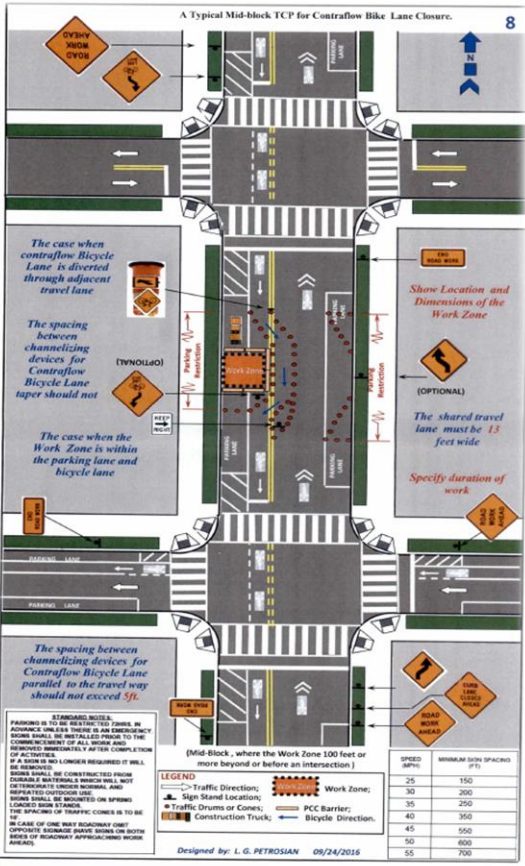
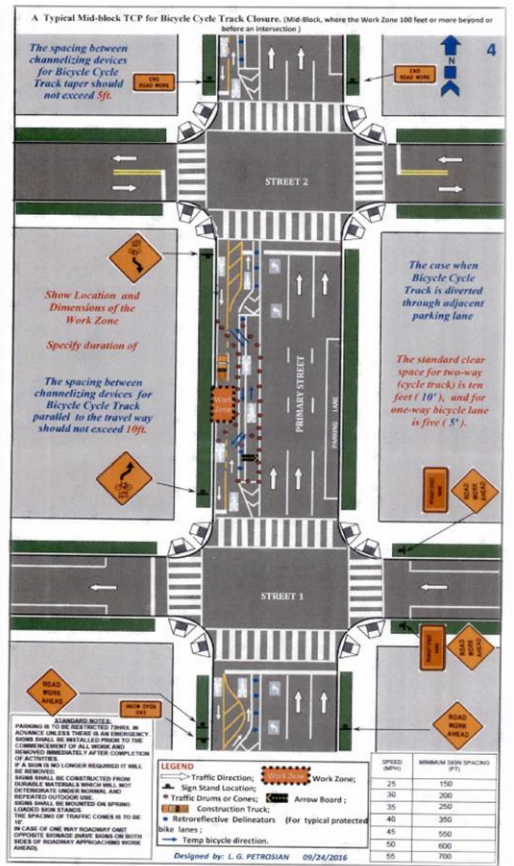
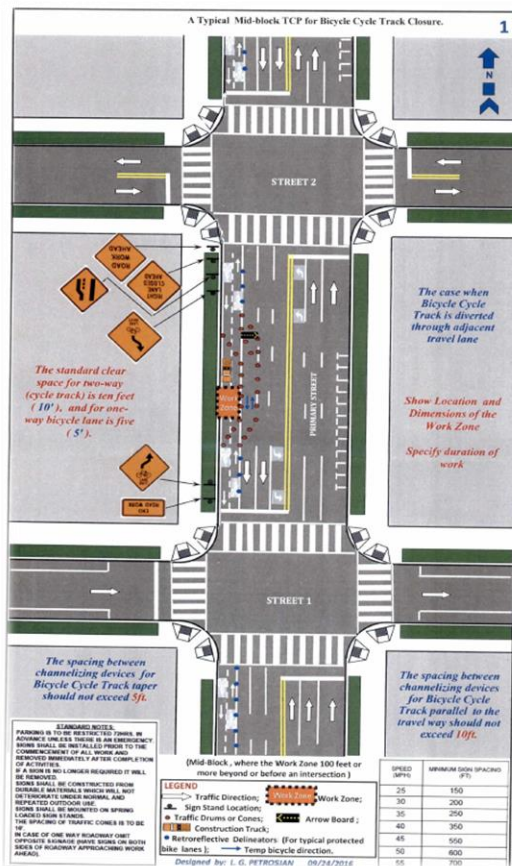
Cyclists Should Experience The Same Bike Lane Experience If Possible

The Best Cyclist Accommodation is Convenient for Cyclists to Use

1. **Maintaining the existing or creating an equivalent bike lane** is most convenient and always preferred when feasible and safe, as determined by DDOT.
2. **Merging** a separated bike lane into a travel lane **is the least preferred alternative other than closing a bike lane all together.** It will be approved as a last resort only if:
 - ✓ There is insufficient space on the roadway to maintain the existing bike facility and
 - ✓ travel and parking cannot be reduced further without creating an unsafe roadway condition as determined by DDOT

Rules Are Good; Typical Traffic Control Plans Makes Them Practical

Bicyclist Accommodation Typical TCPs



DEVELOPMENT OF TYPICALS

- 15 typical work zone guides developed
- 10 stakeholder meetings held
- Intergovernmental, private sector, and cyclists community
- 40+ attendees provided input

Protected Bike Lane
Two Way Roadway

Protected Bike Lane
One Way Roadway

Contraflow Bike Lane

Bicyclists Accommodation In Field training



IN FIELD TRAINING

- Multiple in field trainings held to date
- 133 individuals trained
- 17 different companies attended
- 4 different DDOT offices attended



- Held on different roadways with different bike infrastructure
- Discussed emergency work as well as planned work

15th Street Cycle Track & Sidewalk



During Raze

During Construction



You Can't Always Get What You Want (But You Can Get What You Need)

Conditions Before Construction



Image from Google Street View

Conditions During Construction



- Literally measured the roadway to the inch to find every option
- A fully protected one-way cycle track replaced by a shared lane
- Three through lanes and one turn lane reduced to one through lane and one shared lane
- We changed signal timing, let cyclists enter the shared lane first, and eliminated left turns
- A case study in trade-offs and limitations.

Temporarily Blocking Due to Conflicts with Construction

A Safe Pedestrian or Bicyclist Accommodation may be Blocked Temporarily Due to Conflicts with Construction Activities or Construction Vehicles

Only allowed during off-peak hours (usually 9:30 am to 3:30 pm).

- Flaggers must be posted at each end of the closed pedestrian or bicycle route for the entire duration of time the intermittent closure is in place and must ensure safe passage for all.
- The safe and reasonable flow of pedestrian and bicycle traffic must be maintained in preference to construction activities and the flow of construction vehicles.

Online District Safe Accommodations Resources; Contact Information

[Pedestrian Safety and Work Zones Standards](#)

https://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/pedestrian_safety_and_work_zone_standards_covered_and_open_walkways_july_2010.pdf

[Work Zone Typicals For Bicycle Infrastructure](#)

<https://ddot.dc.gov/page/work-zone-typical-bicycle-cycle-track-closures>

[Safe Accommodations For Pedestrians and Bicyclists Regulation](#)

<https://www.dcregs.dc.gov/Common/DCMR/SectionList.aspx?SectionNumber=24-3315>

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District Department of Transportation