

Session 65

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Improving Pedestrian and Bicyclist Safety in Highway Construction Work Zones

Topic Description

Results of a recent FDOT sponsored study aimed at improving pedestrian and bicyclist safety in highway construction work zones will be presented. Findings with regard to pedestrian and bicyclist behaviors will be presented. MOT and PPM related suggestions for improvement will be discussed.

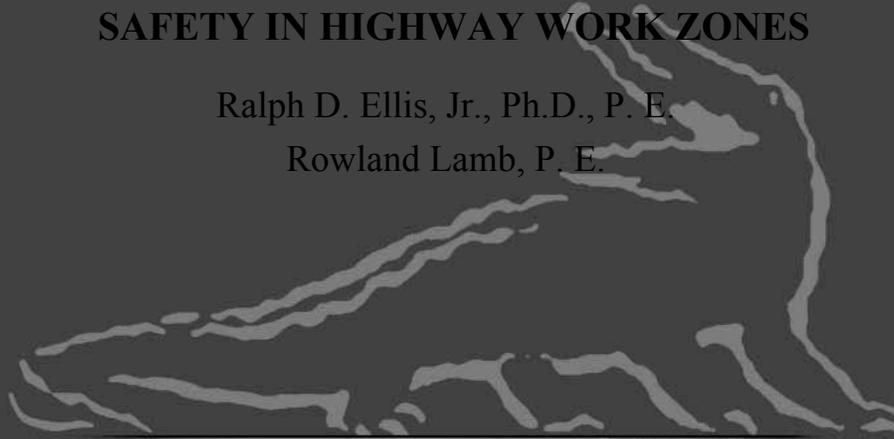
Speaker Biography

Dr. Ralph Ellis is currently Associate Professor in the Department of Civil and Coastal Engineering at the University of Florida where he teaches Construction Engineering. Dr Ellis brings to his university position 15 years of industry experience as a projects manager and company president. He is a registered Professional Engineer. He is an active researcher and has performed many transportation related studies for the FDOT. Dr. Ellis also serves our profession through the following positions: Member of Board of Directors of the Construction Institute of the American Society of Civil Engineers, Member of the Independent Advisory Panel of the Overseas Building Operations Bureau of the U.S. Department of State, Vice President Dispute Review Board Foundation of Florida.

IMPROVING PEDESTRIAN AND BICYCLIST SAFETY IN HIGHWAY WORK ZONES

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Research Team

- Dr. Ralph Ellis
- Dr. Linda Crider
- Rowland Lamb, Coloney Bell Engineering
- Jose Sanda, Ph. D. candidate
- Dennis Scott, FDOT Safety Office

Presentation Agenda

- Background on the Problem
- Research Findings
- Suggestions for Improvement

Work Zones Are Challenging for Pedestrians and Bicyclist



In addition to motorist,
we also have pedestrians and bicyclist
traveling within our work zones.

Unlike the motorist, many of our pedestrians
and bicyclist are children.

MUTCD Provides General Guidance

“A wide range of pedestrians can be expected at work sites, including the young, old, and disabled (for example, hearing, visual, and mobility). All of these pedestrians need a clearly delineated and usable travel path.”

How do we do it?

Research Objective

- Improve non-motorist safety in highway construction work zones

Analysis of the Crash data

Florida Crashes 1999 to 2002

**210 Work Zone Accidents Involving Death or Injury to
Non-Motorist**

- 45 % of the accidents were caused by pedestrians or bicyclist failing to yield
 - 23 % of the accidents were caused because the vehicles were driving outside of their lane.
 - 66% of the crashes in the study involved pedestrians and 34% involved bicyclist.
- Pedestrian's accidents are twice as frequent as bicyclist's accidents.

Analysis of the Crash data

- In 68% of the accidents the at-fault vehicle was moving in the straight-ahead direction.
- The second most prevalent movement type was a right turn at 12% followed by a left turn at 6%.

Survey Input From Bicyclist

Bicycle Group Meetings and Solicited On-Line Responses

- Bike lanes or pedestrian walkways should continue through or around the construction zone.
- Clear signs should give non-motorists advance warning of construction zones ahead.
- Road surface conditions should be adequately maintained and free of sudden drops or construction debris.

Survey of Bicyclist

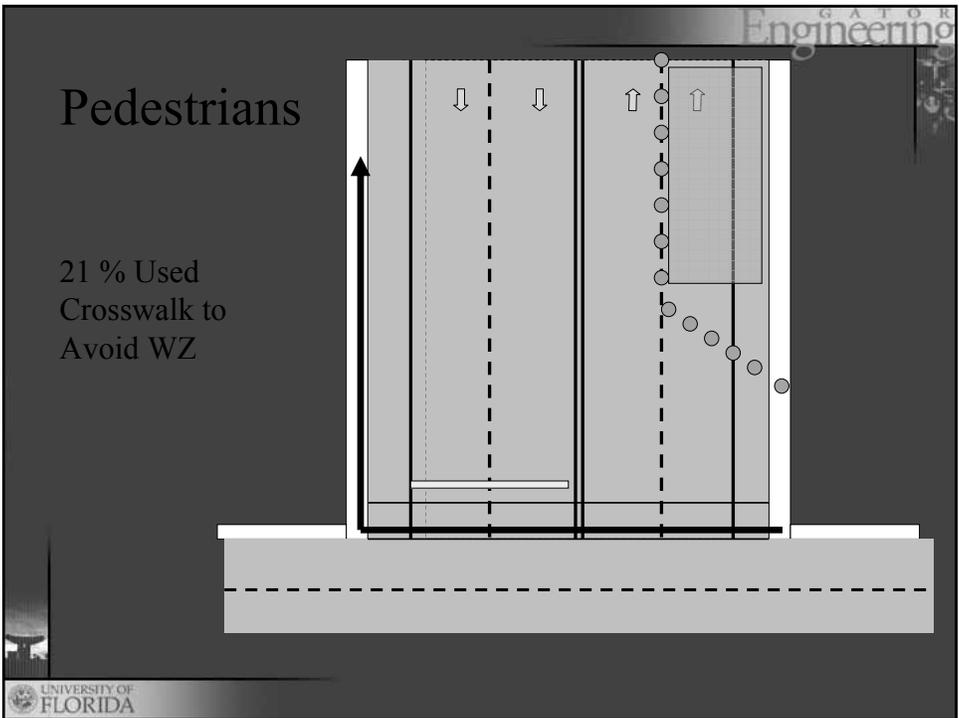
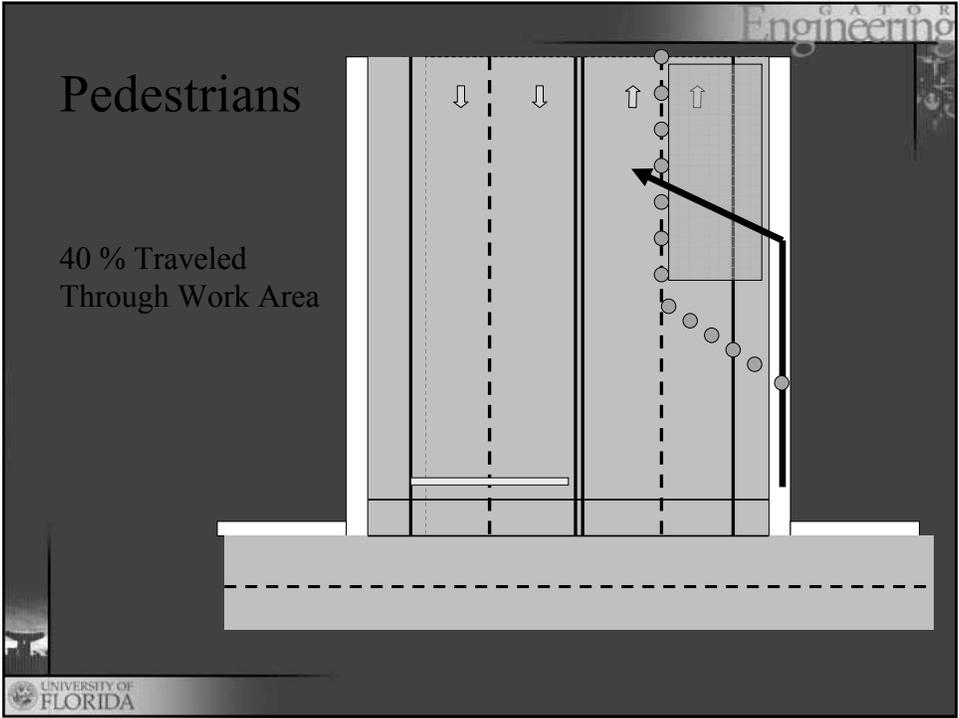
- The speed of motorists should be controlled in construction zones.
- When conditions are not safe, non-motorists should be advised to use detours and alternative routes.

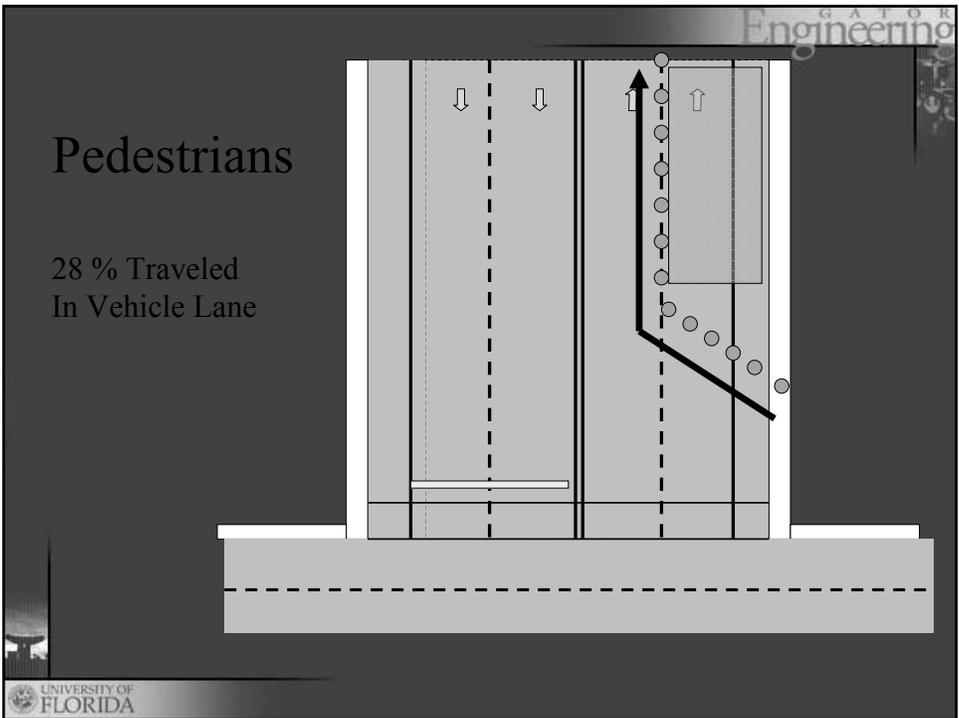
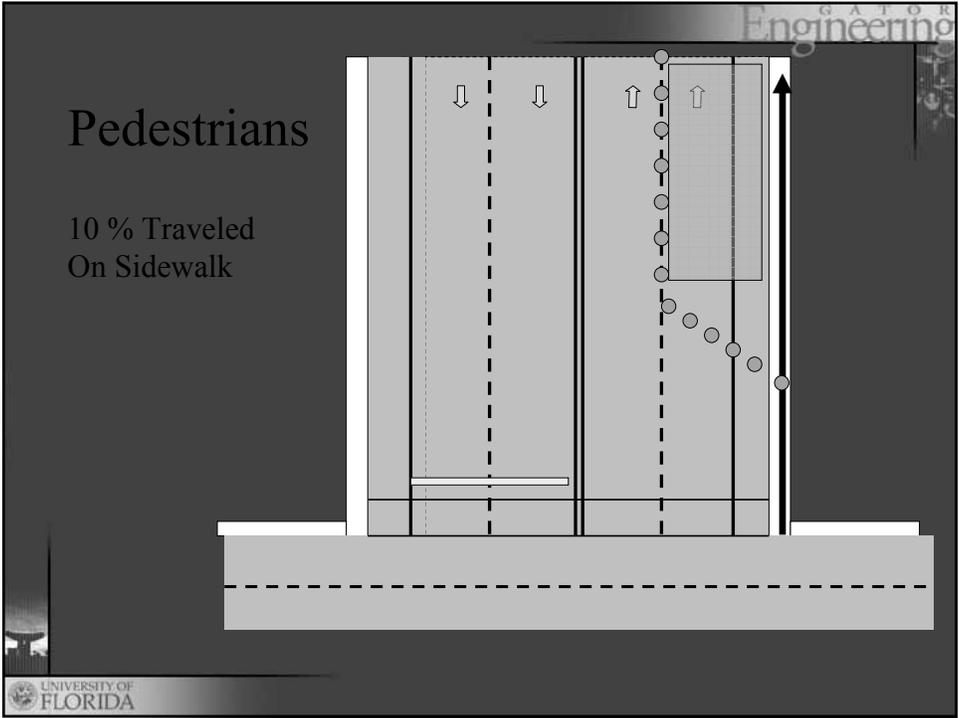
Observations of Non-Motorist in Work Zones

Pedestrian and bicyclist behavior was video recorded in 5 FDOT work zones with Compliant MOT. Non-motorist behavior was analyzed.

Pedestrians (1052 Observations)
79% At-Risk Behavior

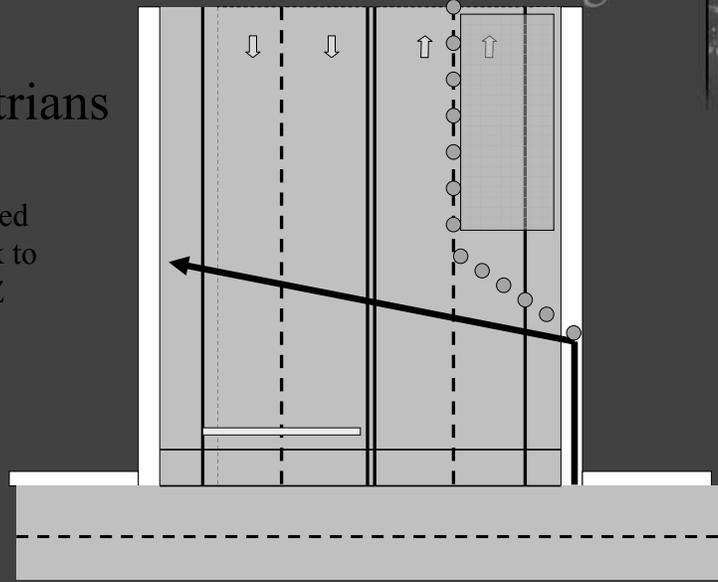
Bicyclist (152 Observations)
40% At-Risk Behavior





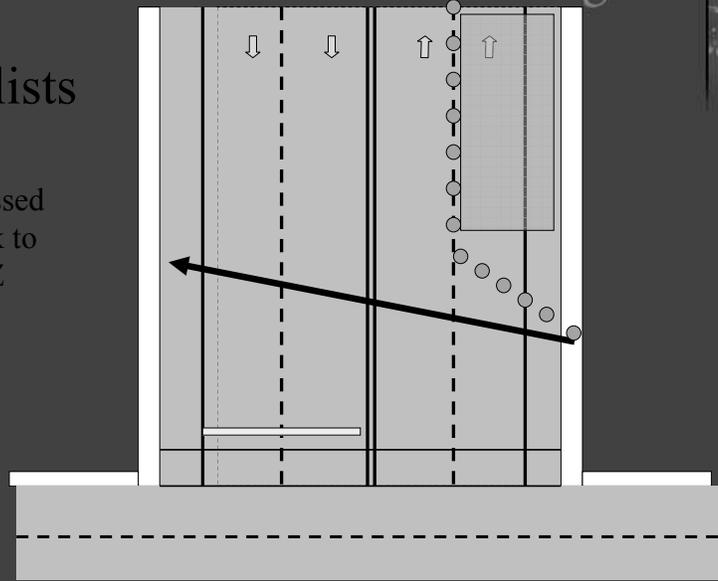
Pedestrians

1 % Crossed
Mid Block to
Avoid WZ



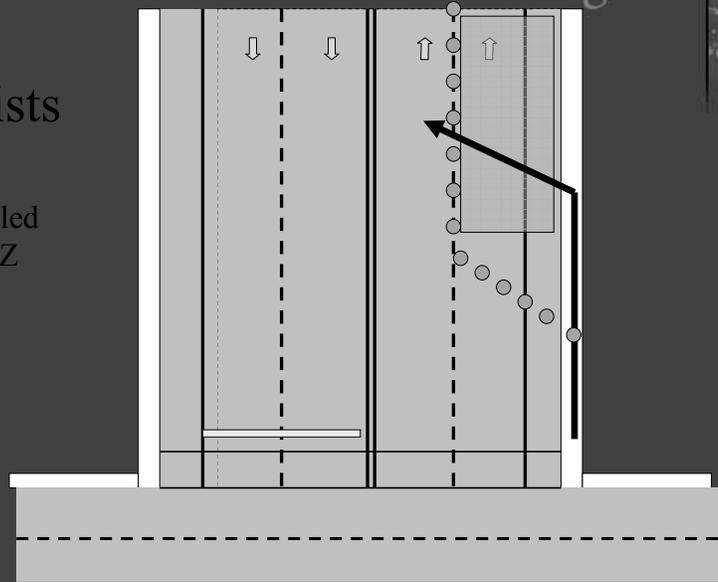
Bicyclists

17 % Crossed
Mid Block to
Avoid WZ



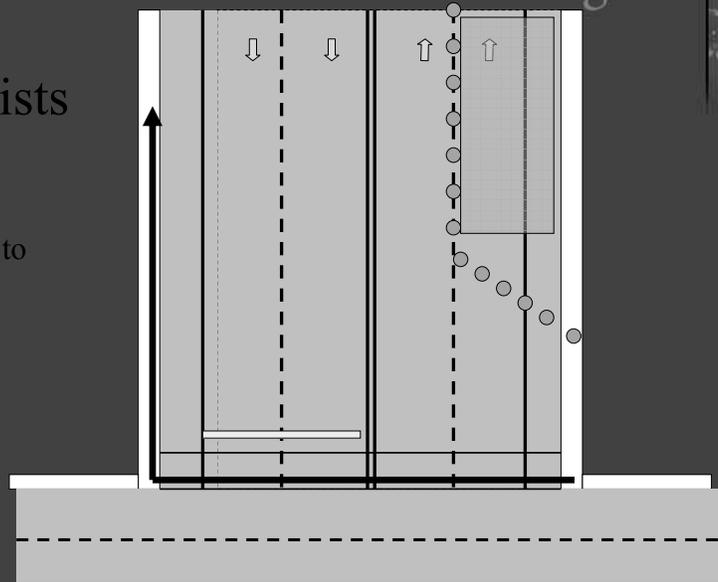
Bicyclists

24 % Traveled Through WZ



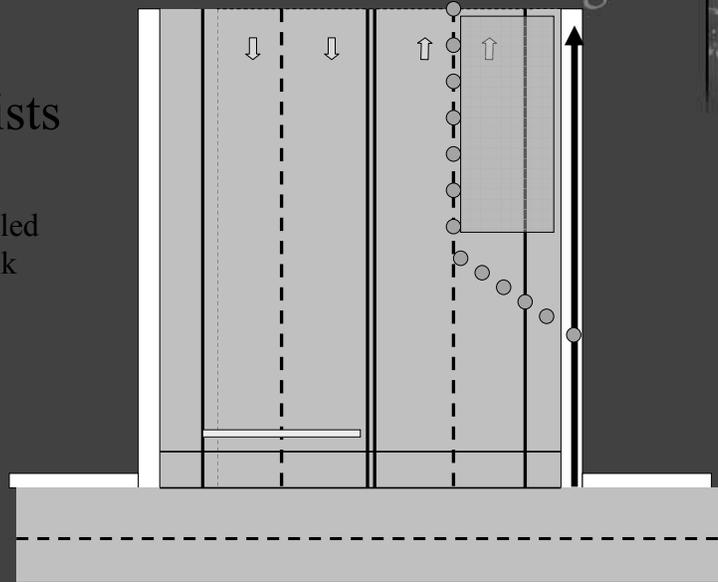
Bicyclists

40 % Used Crosswalk to Avoid WZ



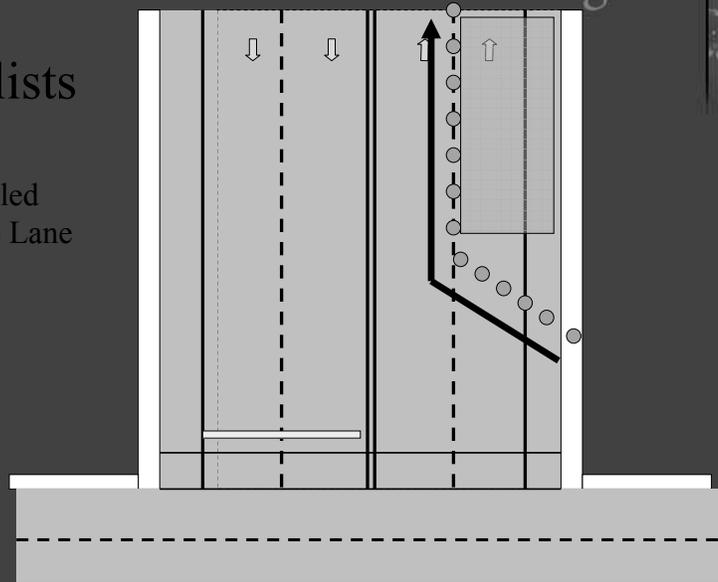
Bicyclists

17 % Traveled
On Sidewalk



Bicyclists

2 % Traveled
In Vehicle Lane



Preliminary Recommendations Of the Research Team

Not Yet Review By FDOT

Conceptual MOT Recommendations Bicyclists

General Guidance

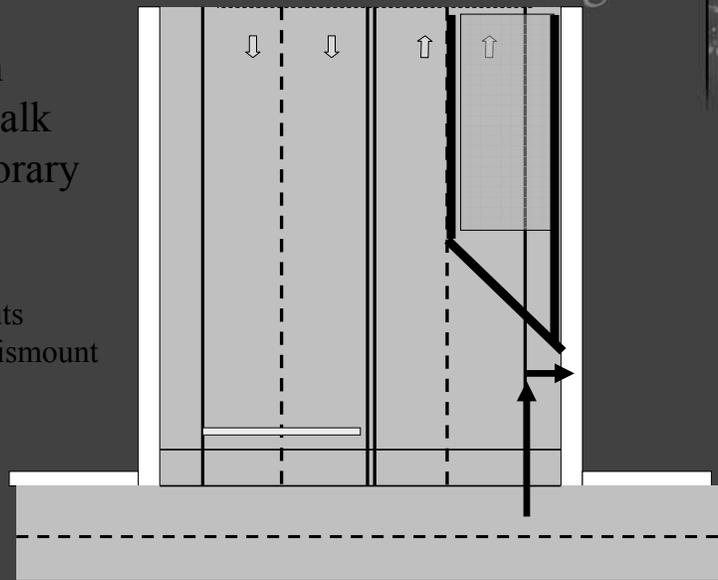
- Bicyclist and Vehicles should not share travel lanes in Work Zones
- Public advance notice should be given
- Proper Signing is needed

MOT Options

- Detour
- Diversion

Bicycle Diversion To Sidewalk Or Temporary Pathway

- No Curb Cuts
- Bicyclists dismount
- Signing
- Barrier



Conceptual MOT Recommendations Pedestrians

General Guidance

- Pedestrian entry into WZ should be prevented by barrier
- Pedestrians should be provided a clearly delineated, safe travel route

Conceptual MOT Recommendations Pedestrians

MOT Options (in order of preference)

1. Provide temporary pathway adjacent to existing sidewalk
2. Provide temporary path outside of vehicle travel lane
3. Detour pedestrians across street

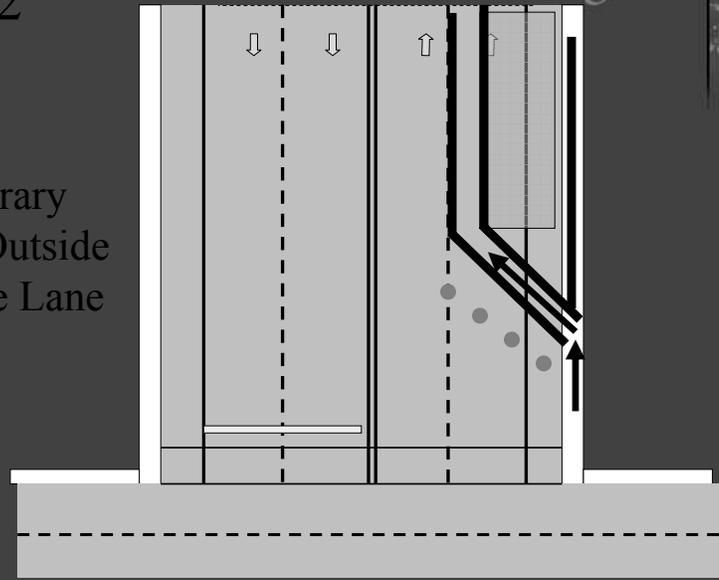
Option 1

Pedestrian
Diversion
To Temporary
Pathway
Adjacent to
Existing
Sidewalk



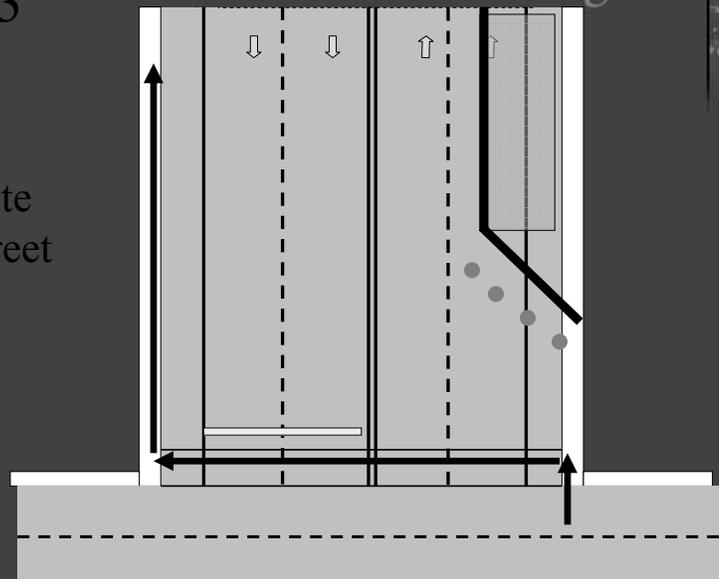
Option 2

Pedestrian
Diversion
To Temporary
Pathway Outside
Of Vehicle Lane



Option 3

Pedestrian
Detour
To Opposite
Side of Street



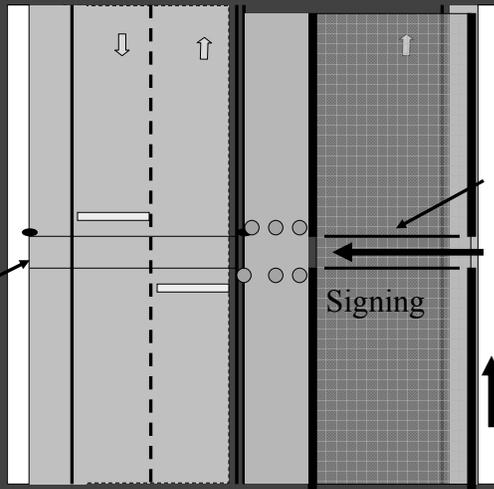
Temporary Mid-Block Crossings

General Guidance

1. Provide temporary mid-block crossings when crossing interval exceeds 300 feet

Temporary Mid-Block Crossing

Temp. Controlled Crossing

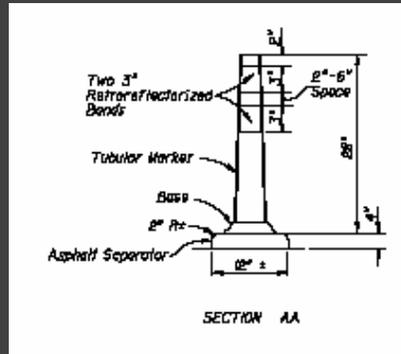


Temp. Traf. Separator W/ Tubular Markers

Signing

Flagger required when construction equipment must cross. Equipment signed to stop and look for pedestrians.

Temporary Asphalt Separator With Tubular Markers Standard Index 600



Questions?