

2017 Work Zone Update

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- ▶ These materials are intended to assist employers, workers, and others as they strive to improve work zone safety. All of the pictures, video and information in the following presentation are to be utilized for training purposes only. Any individuals or companies named or shown can not be retroactively perused based upon information gained during this presentation as it is being utilized for training and education purposes.

Work Zone Safety

- ▶ The MMUTCD, Part 6 states:
 - ▶ The primary function of TTC is to provide for the reasonably safe and efficient movement of road users through or around TTC zones while reasonably protecting workers, responders to traffic incidents, and equipment.

Work Zone “Defined”

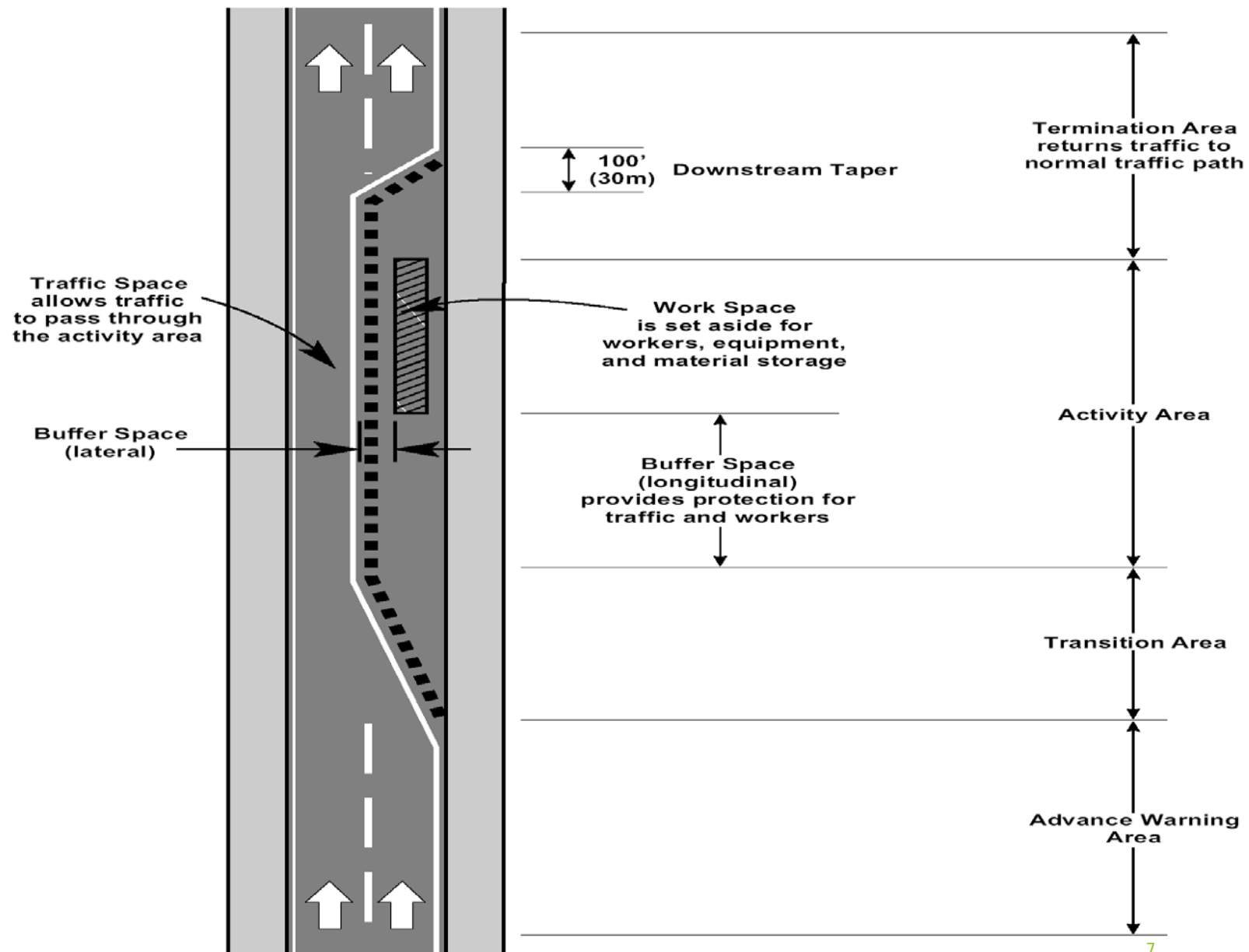
- ▶ “Work zone” means a portion of a street or highway that meets any of the following:
 - (a) Is between a “work zone begins” sign and an “end road work” sign.
 - (b) For construction, maintenance, or utility work activities conducted by a work crew and more than 1 moving vehicle, is between a “begin work convoy” sign and an “end work convoy” sign.

Work Zone “Defined”

- ▶ (c) For construction, maintenance, surveying, or utility work activities conducted by a work crew and 1 moving or stationary vehicle exhibiting a rotating beacon or strobe light, is between the following points:
 - ▶ (i) A point that is 150 feet behind the rear of the vehicle or that is the point from which the beacon or strobe light is first visible on the street or highway behind the vehicle, whichever is closer to the vehicle.
 - ▶ (ii) A point that is 150 feet in front of the front of the vehicle or that is the point from which the beacon or strobe light is first visible on the street or highway in front of the vehicle, whichever is closer to the vehicle.

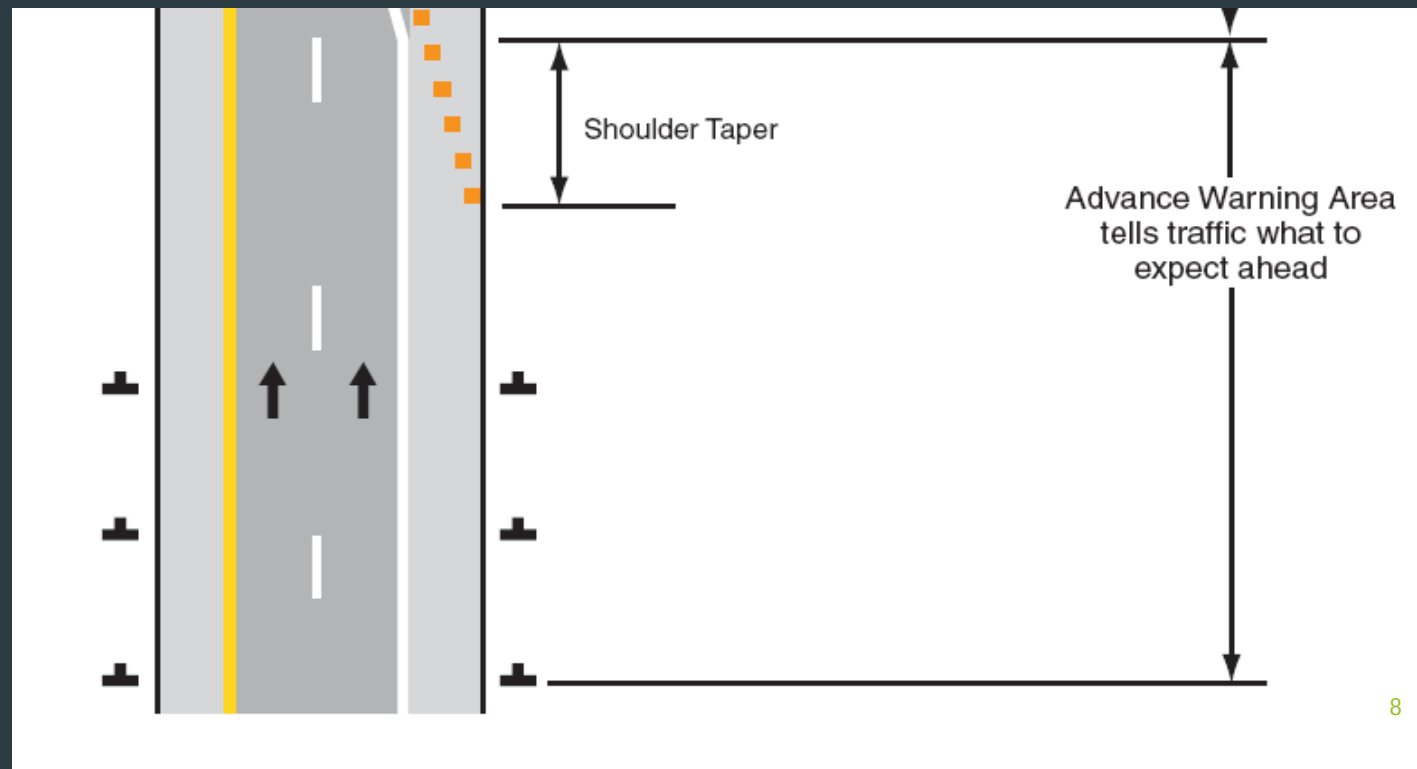
Four Components

- ▶ What are the four components of a work zone?
 - ▶ Advance Warning
 - ▶ Transition
 - ▶ Activity
 - ▶ Termination



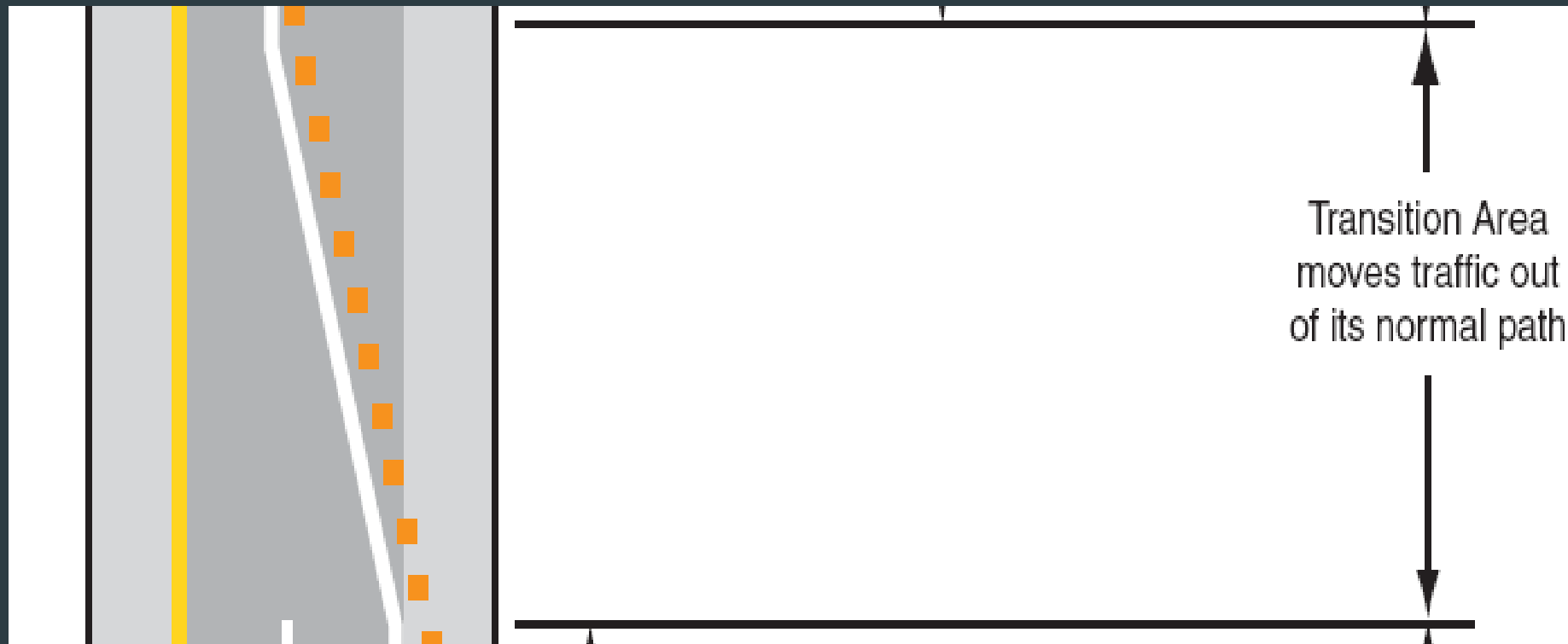
Advance Warning Area

- The section of highway where road users are informed about the upcoming work zone or incident area.



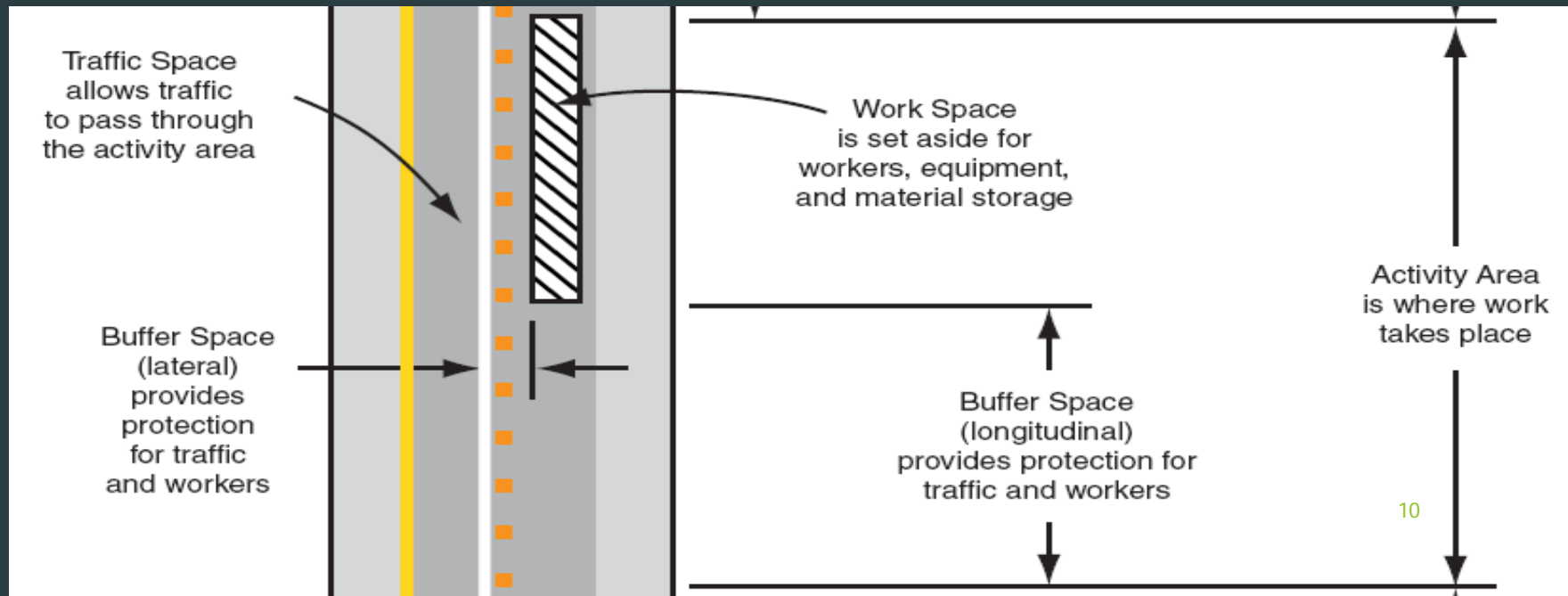
Transition Area

- ▶ Redirects motorists out of their normal path.
- ▶ Channelizing devices are required.



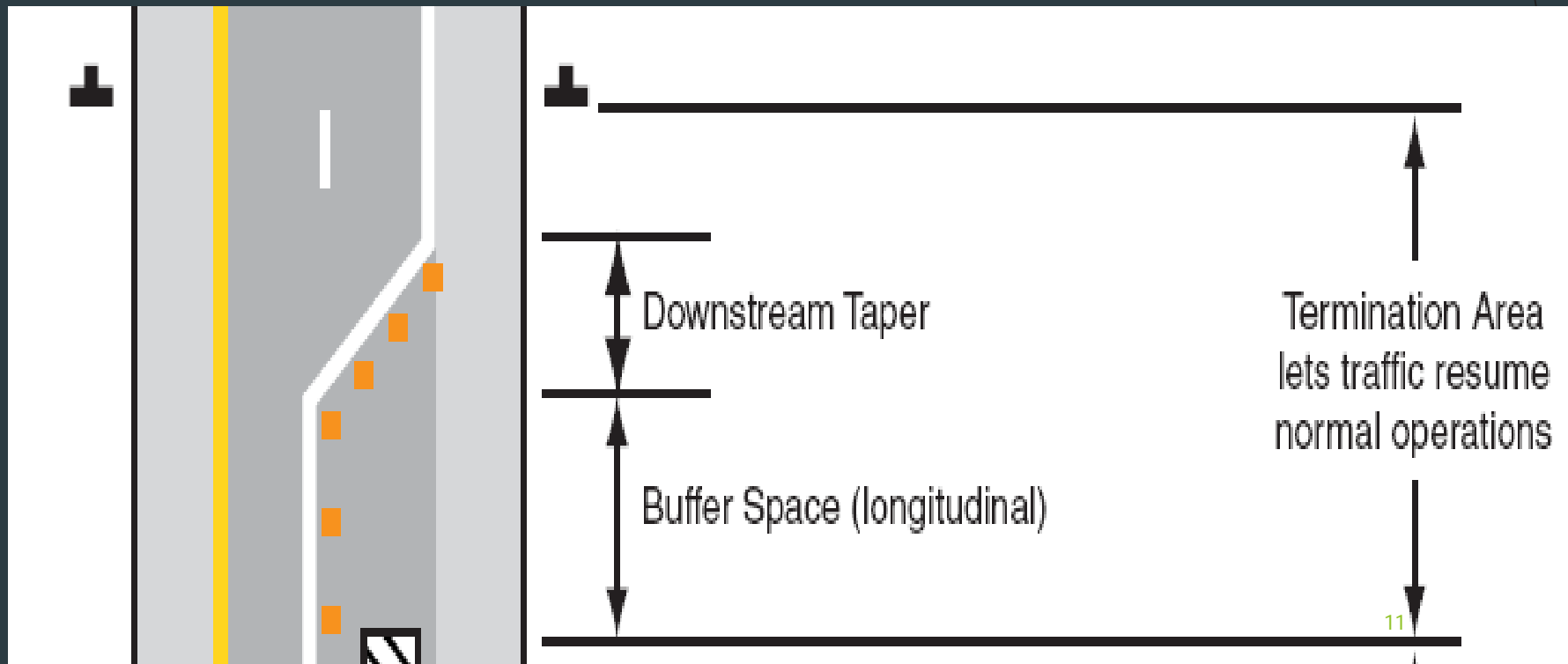
Activity Area

- ▶ This is where the work takes place.
 - ▶ Closed to traffic and set aside for workers.
 - ▶ the portion which is used route traffic through the activity (work) area.
 - ▶ Includes motorized and non-motorized



Termination Area

- ▶ Used to return traffic to its normal path and speed.
 - ▶ Speed limit sign
 - ▶ 'END ROAD WORK' sign, placed after the speed limit sign, if a "WORK ZONE BEGINS" sign is used to define the work zone.



High Vis Clothing

- ▶ Worker Visibility Final Rule put into effect for federal aid roadways Nov. 24, 2008
- ▶ High Vis Clip



Device Spacing

- ▶ *The spacing between cones, tubular markers, vertical panels, drums, and barricades on Roadways with a posted speed limit of 45 MPH or greater should be placed at 50' when used for taper channelization, and a distance of 100' when used for tangent channelization.*
- ▶ *The spacing between cones, tubular markers, vertical panels, drums, and barricades on Roadways with a posted speed limit of less than 45 MPH should not exceed a distance in feet equal to 1.0 times the work zone speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the work zone speed limit in mph when used for tangent channelization.*

Arrow Panels

- ▶ INSPECTORS CHECKLIST for SOLAR BOARDS (form 1013S)
- ▶ The following is an option to be used in conjunction with the 2012 MDOT Standard Specifications
- ▶ Section 922.07

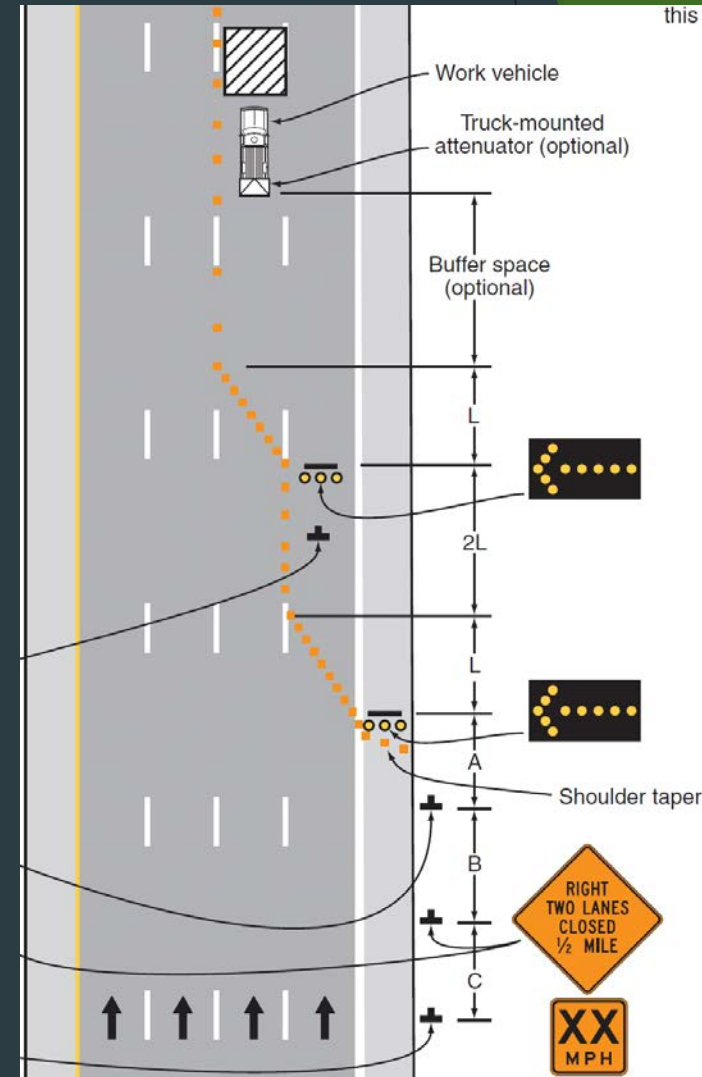


Lighted Arrow Boards



TAs with freeway lane closures

- TAs 37, 38, 39, 42, and 44
- Arrow board shall be used for all freeway lane closures
- Separate arrow board shall be used for each closed lane for multi-lane closures



Location

- ▶ Locate on the shoulder at the beginning of the taper, or,
- ▶ Locate as close as possible to the beginning of the taper or in the lane if necessary



Arrow Boards

- ▶ Type A - low speed urban
- ▶ Type B - Intermediate speed & maintenance or mobile operations on high-speed roadways.
- ▶ Type C - High speed, high volume projects
- ▶ Type D - intended for use on authorized vehicles
 - ▶ Snow Plows, Paint Trucks, Cold patching Crews
- ▶ Form # 1013S
 - ▶ Covers requirements

Table 5. Arrow Display Types and Requirements

Panel Type	Minimum Size (in)	Min. Legibility Distance (miles)	Minimum Number of Lighted Elements
A	48 x 24	1/2	12
B	60 x 30	3/4	13
C	96 x 48	1	15
D	None*	1/2	12

*Length of arrow equals 48in., width of arrowhead equals 24 in.

Worker Behavior?

- ▶ How do you like the worker position in relation to the cones?

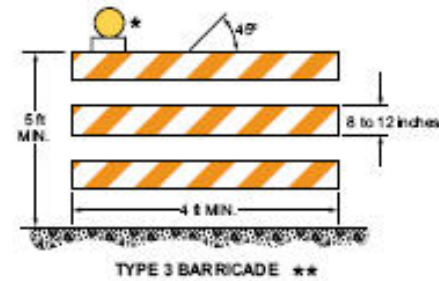


Worker Behavior

- ▶ Do you like this position better?



Figure 6F-7. Channelizing Devices (Sheet 2 of 2)

**LEFT DIRECTIONAL**

Where left turns are provided and/or vehicles are to pass to the left of the barricade, the barricade stripes should slope downward in the left direction from the center of the barricade or barricades.

**RIGHT DIRECTIONAL**

Where right turns are provided and/or vehicles are to pass to the right of the barricade, the barricade stripes should slope downward in the right direction from the center of the barricade or barricades.

**UNI-DIRECTIONAL**

Where both right and left turns are provided at the point of the closure and/or vehicles may pass to the right or to the left of the barricade, the barricade stripes should slope downward in both directions from the center of the barricade or barricades.

**TOTAL CLOSURE**

Where no turns are intended, at the point of closure and vehicles shall not pass beyond the barricade, the stripes should be positioned to slope downward toward the center of the barricade or barricades.

* Warning lights (optional)

** Rail stripe widths shall be 6 inches, except that 4-inch wide stripes may be used if rail lengths are less than 36 inches. The sides of barricades facing traffic shall have retroreflective rail faces.

Type III Details

Video of 12 mile crash



What Do I Need, And How Do I Know?

- Who would you rather be?



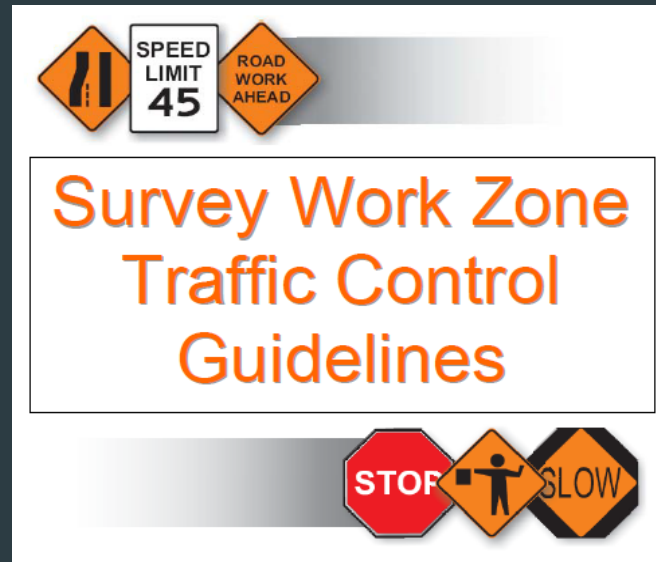
Work Zone Resources

www.michigan.gov/mdotworkzones

MMUTCD
Revised Sept 2013

► Being Created

► Currently Under Revision



General Update

www.michigan.gov/mdotworkzones

Sign up for the Emails!



The screenshot shows the MDOT website with a navigation menu on the left and a main content area. The main content area is titled "Work Zone Safety and Mobility (WZSM) - News" and lists several documents for download, each with a PDF icon. A "Sign up for email from MDOT!" button is visible at the bottom left. A cartoon character with a green arrow pointing down is also present.

MDOT
Michigan Department of Transportation

Search

Autumn's harvest is plentiful along Michigan's rural highways.

Roads and Travel
Rail and Public Transit
Bridges, Borders and Ferries
News and Information
Projects and Programs
Maps
Reports, Publications and Specs
About MDOT
Doing Business
Forms
Contractor Services
Vendor/Consultant Services
Local Agency Program
Passenger Transportation
Aeronautics

MDOT > DOING BUSINESS

Work Zone Safety and Mobility (WZSM) - News

- SOA 2014-001 Use of Lag Screws on Temporary Breakaway Wood Supports PDF
- Mobility Process Review Report PDF
- SOA 2012-03 Temporary Supports PDF
- SOA 2012-02 Leap Frog PDF
- IM12-07 - Type D Lights on Plastic Drum Channelizing Devices (Supersedes BOH IM 2010-11) PDF
- SOA 2012-01 NTCIP PCMS SP PDF
- BOH IM11-02 Portable Changeable Message Signs PDF
- BOH IM10-11 Type D Lights on Plastic Drum Channelizing Devices PDF
- RC-1543 - Evaluation of Steady-Burn Warning Lights on Channelizing Drums in Work Zones PDF
- Work Zone Audit Report (Form 0397) PDF
- News Archive

About Us

- **Receive E-mail Updates** 
Sign up for e-mail updates for Work Zone Safety and Mobility through MDOT's GovDelivery e-mail system.
- Contact Us
- WZSM Background

Mobility Impact Map

- **View Mobility Impact Map**
View an interactive statewide map of mobility restrictions.

Quick Links

- Title VI Nondiscrimination
- Tribal Governments
- Twitter Facebook YouTube
- Mi Drive
- State Map

Sign up for email from MDOT! 

Understanding The Motorist

- ▶ The Motorist may also have physical limitations or reduced skills:
 - ▶ Poor vision
 - ▶ Reduced reaction time
 - ▶ Medications
 - ▶ Distracted driving







Mobile Attenuators – (MA)

- ▶ Must use if any of the following take place while in an aerial lift
 - ▶ Aerial work is performed on scaffolding, lifts, hoists, bucket trucks, etc., when workers using this equipment are in a closed lane not protected by temporary barrier. *(Not intended to be used for the removal, installation, or maintenance of traffic signals.)*
 - ▶ Mobile / short duration operations such as pavement marking convoys, raised pavement marker replacements, grinding in rumble strips, **permanent sign installations, luminescent installations**, etc. *(Not intended to be used for the removal or installation of special markings.)*
 - ▶ Aerial work is performed on scaffolding, lifts, hoists, bucket trucks, etc., where workers using this equipment are on the shoulder not protected by temporary barrier for longer than one hour in duration. *(Not intended to be used for the removal, installation, or maintenance of traffic signals.)*



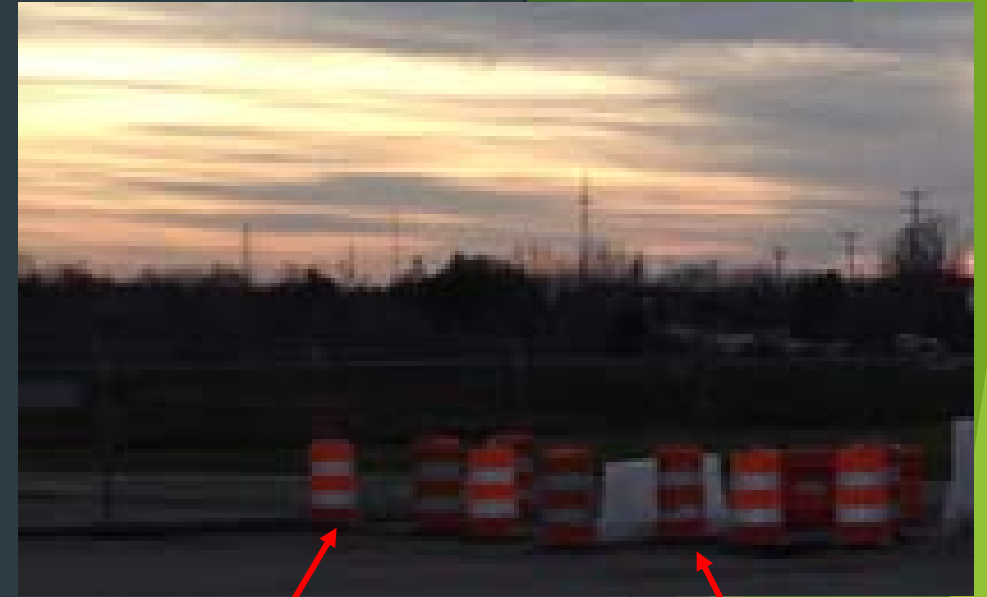
MAs

- ▶ Mobile attenuators must not be mounted on the vehicle or equipment used by personnel to complete aerial work. The use of a mobile attenuator should be considered for other operations depending upon the level of worker exposure.
- ▶ Engineering judgment is used to determine the appropriate form of TTCD to complete the work on every project.
- ▶ Mobile attenuators may not be used as a barrier ending except during the replacement of a damaged barrier ending. In the event that a mobile attenuator is used as a temporary safety measure for a damaged barrier ending, the maximum length of time that it can be used for this purpose is 48 hours or as approved by the Engineer.



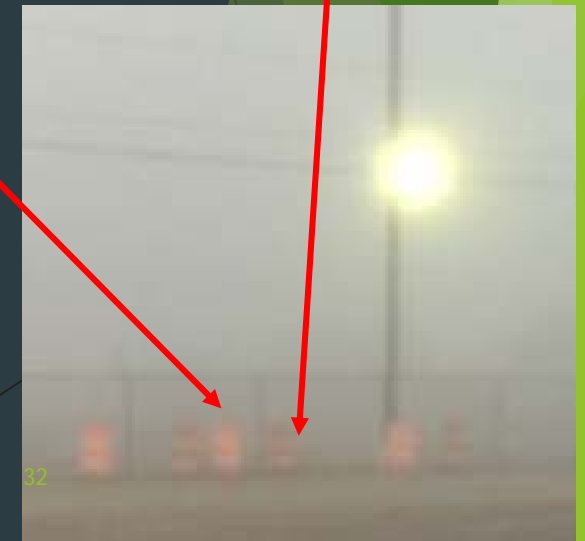
Florescent Drum Sheeting

- ▶ Currently specified in 22 states
- ▶ Increased Reaction Time
 - ▶ 180 addition feet of sight distance at 50 MPH (Football Field = 360 feet)
 - ▶ Better visibility in dusk, dawn, and rainy conditions
- ▶ 2010-2014 dusk, dawn and rainy work zone crashes target with this treatment
 - Fatalities – 52 out of 137 total (38%)
 - Serious Injuries – 2,239 out of 6,881 (33%)
 - Crashes – 11,568 out of 37,339 (31%)



Proposed

Current



Dates and Time Frames

- ▶ 4/7/2016 - Notify of the upcoming phase in period for Type IV Fluorescent and Type IV White requirements
 - ▶ 10/1/17 - All "I" routes.
 - ▶ 10/1/18 - All "BR" "US", and "M" routes.
 - ▶ 10/1/20 - All projects let through MDOT, including local agency projects, maintenance, utility, and permit work.
- ▶ There will be a new Pay item and Spec when the new devices are in the plans
 - ▶ Plastic Drum, Fluorescent, Furn
 - ▶ Plastic Drum, Fluorescent, Oper
 - ▶ Channelizing Device, 42 Inch, Fluorescent, Furn
 - ▶ Channelizing Device, 42 Inch, Fluorescent, Oper



2017 Operational Needs

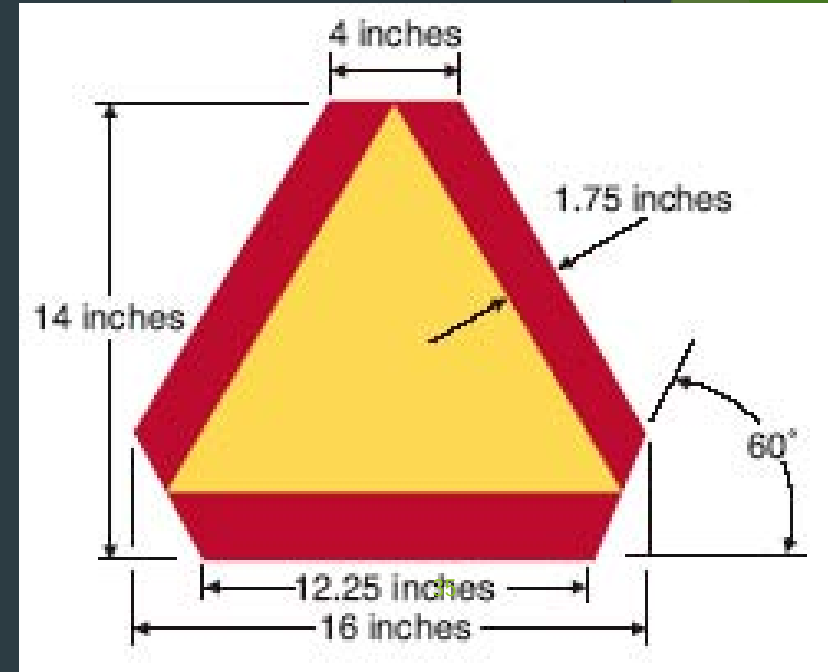
- ▶ Have enough CORRECT signing to close a major freeway in each direction
- ▶ Have enough CORRECT Lighted Type III's to close a major freeway in each direction
- ▶ Have enough CORRECT drums or grabber cones to close a major freeway
- ▶ <http://www.atssa.com/WorkZoneSafetyGrant/App>

Construction Equipment in Traffic

Section 257 - 62, 216, 302



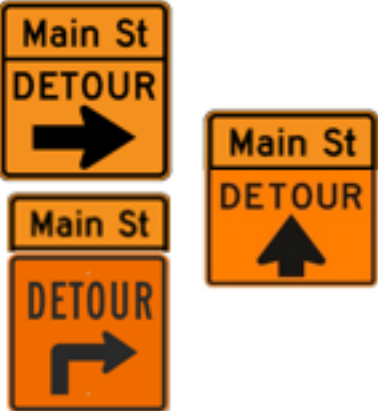
- ▶ Michigan Vehicle Code 257.688
 - ▶ An equilateral triangle in shape, at least 16 inches wide at the base and at least 14 inches in height: with a dark red border, at least 1-3/4 inches wide of highly reflective beaded material
 - ▶ A center triangle, at least 12-1/4 inches on each side of yellow-orange fluorescent material

- Shall be mounted on the rear of the vehicle, broad base down, not less than 3 feet nor more than 5 feet above the ground and as near the center of the vehicle as possible.



Detours



Table 6.8: NON-TRUNK LINE DETOUR SIGNING DESIGN GUIDELINES

Detour Duration	Non-Trunk Line Detour	
	Signing	Example (*all road name signs to be paid for as sign type B special)
< 1 Day	<ul style="list-style-type: none"> M4-9 (R) (L) - Detour Sign with appropriate directional arrow at each decision point. 	
1-3 Days	<ul style="list-style-type: none"> M4-9 (R) (L) - Detour Sign with Road Name Plaque and appropriate directional arrow at each decision point. 	
> 3 days	<ul style="list-style-type: none"> M4-9 (R) (L) (U) - Detour Sign with Road Name Plaque and appropriate directional arrow at each decision point near right and far left corners of the intersection. M4-9 (UL) (UR) - to be placed in advance of each turn. An "up" pull through arrow should be required after each major intersection, and should be considered after each turn decision point. 	



Detours

TABLE 6-9: TRUNK LINE DETOUR DESIGN SIGNING GUIDELINES

Detour Duration	Trunk Line Detours	
	Signing	Example
< 3 Days	<ul style="list-style-type: none"> M1-1, M1-2, M1-3, M1-4, M1-6 Route Marker Sign M4-8 Detour Plaque M6-1(R)(L), M6-2(R)(L) Directional arrow at each turn or exit. 	
> 3 days	<ul style="list-style-type: none"> M1-1, M1-2, M1-3, M1-4, M1-6 Route Marker Sign with directional plaque <u>must</u> be placed in advance and at each turn. M4-8 Detour Plaque M5-1, M5-2, M5-3, M6-1, M6-2, M6-3 Directional Arrow at each turn or exit An "up" pull through arrow is recommended after each major interchange and after each <u>turn</u> or exit. 	



Detours

TABLE 6-10: DETOUR SIGNING PLACEMENT GUIDELINES

Detour Signing Placement Guidelines			
Roadway	Turning Detour Signing	Advance Turn Detour Signing	Pull Thru Detour Arrow Signing
Non-Freeway	50 feet (min) before intersection spring point	500 feet (min) before intersection spring point.	500 feet (max) after intersection
Freeway	100 feet (min) before exit lane taper	1/2 Mile (min) before exit lane taper	500 feet (max) after lane merge taper
Ramps	50 feet (min) before spring point	500 feet (min) before spring point	N/A







Sign Storage



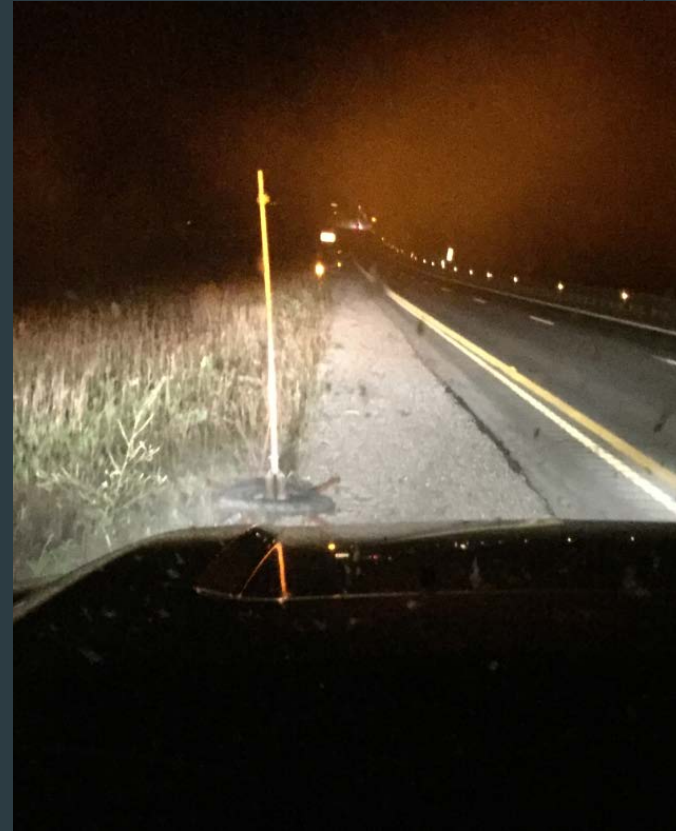
Bottom Height



Sign Storage



Sign Storage



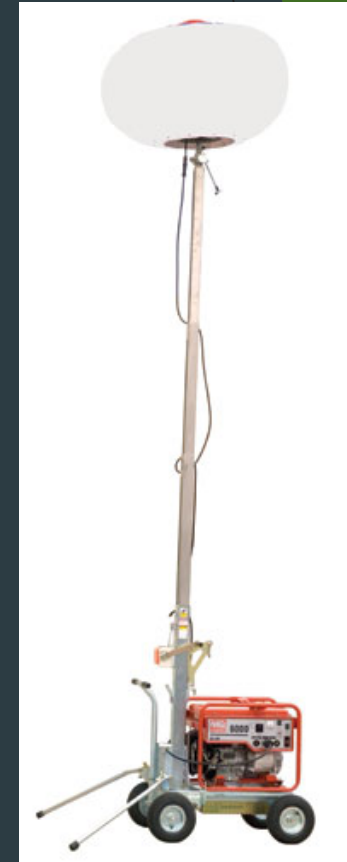


SQ2 Short Term Active Work

New Option for active work operations



Lighting Options



Work Zone Lighting

- ▶ MIOSHA Rule
 - ▶ 5 foot candles required where work is not being immediately performed but where workers may pass through.
 - ▶ 10 foot candles shall be provided on a jobsite where construction work is being performed.
- ▶ MIOSHA and MDOT will be enforcing this rule
 - ▶ Inadequate lighting = project shut down and citation by MIOSHA.
 - ▶ 2012 Spec Book 812.03.H



Maintenance/Small Crew Lighting



Detours



Contractor Location





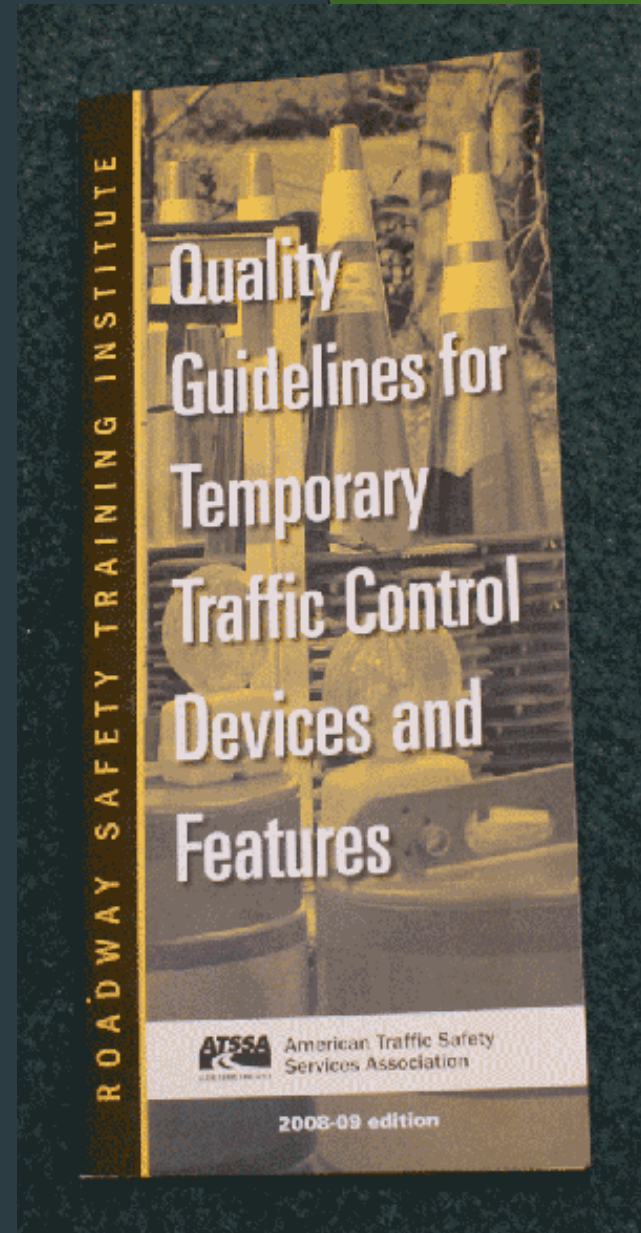








Evaluation of TTC





Winter maintenance



Water Filled Attenuators



MDOT Videos

- ▶ One Step From Death – Scott's Story
 - ▶ <https://www.youtube.com/watch?v=zVIfMZU--5U>
- ▶ MDOT Personal Protective Equipment
 - ▶ <https://www.youtube.com/watch?v=JxvIFRcC8HA>
- ▶ MDOT Night Maintenance (Nighttime Work Zone Safety)
 - ▶ <https://www.youtube.com/watch?v=ucSjhnVTFpA>

When Working Near Traffic...Your Responsibilities

- ▶ Think Safety at all times
- ▶ Always look and listen.
- ▶ Do not walk side by side.
- ▶ Know where you are at all times.
- ▶ Always try to have an escape path.
- ▶ When possible, work with a traffic spotter.
- ▶ When possible do not turn your back to traffic.

When Working Near Traffic...Your Responsibilities

- ▶ Think Safety at all times.
- ▶ Assume all lanes are open to traffic.
- ▶ Never assume that traffic sees you.
- ▶ Never assume that the driver is driving safely.
- ▶ Pay attention to work equipment and operators.

Questions?

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