
DE MUTCD committee began meeting in Jan. 2010 to establish DE-specific guidance

DE MUTCD submitted to Delaware Register for public comment in Spring 2011

http://regulations.delaware.gov/services/current_issue.shtml

All presentation materials are DRAFT
• Paragraphs are numbered
• **Guidance is italicized**
• No more metric
• Definitions relocated to Part 1
• **Standards remain bold**
• Options and support remain unformatted
• Delaware Revisions in blue with line in margin and “(DE Revision)” at beginning of paragraph
Section 1A.13 Definitions of Headings, Words, and Phrases in this Manual

01 (DE Revision) When used in this Manual, the text headings of Standard, Guidance, Option, and Support shall be defined as follows:

A. Standard—a statement of required, mandatory, or specifically prohibitive practice regarding a traffic control device. All Standard statements are labeled, and the text appears in bold type. The verb “shall” is typically used. The verbs “should” and “may” are not used in Standard statements. Standard statements are sometimes modified by Options.

B. Guidance—a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All Guidance statements are labeled, and the text appears in unbold type. The verb “should” is typically used. The verbs “shall” and “may” are not used in Guidance statements. Guidance statements are sometimes modified by Options.

C. Option—a statement of practice that is a permissive condition and carries no requirement or recommendation. Option statements sometime contain allowable modifications to a Standard or Guidance statement. All Option statements are labeled, and the text appears in unbold type. The verb “may” is typically used. The verbs “shall” and “should” are not used in Option statements.

D. Support—an informational statement that does not convey any degree of mandate, recommendation, authorization, prohibition, or enforceable condition. Support statements are labeled, and the text appears in unbold type. The verbs “shall,” “should,” and “may” are not used in Support statements.

- Standards are requirements that **SHALL** be followed unless there is an Option.
- DE Standard: **Reverted to 2003 MUTCD language allowing engineering judgment**
- Guidance is recommended and **SHOULD** be followed
- Options **MAY** be followed and are sometimes modifications to Standards and Guidance
PART 6 TEMPORARY TRAFFIC CONTROL

• 6A: General
• 6B: Fundamental Principles
• 6C: Temporary Traffic Control Elements
• 6D: Pedestrian and Worker Safety
• 6E: Flagger Control
• 6F: Temporary Traffic Control Zone Devices
• 6G: Type of Temporary Traffic Control Zone Activities
• 6H: Typical Applications
• 6I: Control of Traffic through Traffic Incident Management Areas
Section 6A.01 General

Consider needs of all road users

TTC planning begins at project scoping and extends through final design and construction

DE Guidance: TTC plan complying with “Work Zone Safety and Mobility Procedures and Guidelines”

TTC plans can deviate from typical applications
WORK ZONE SAFETY AND MOBILITY

PROCEDURES AND GUIDELINES

September 10, 2007
• 7 fundamental principles of TTC:
  
  – Develop plans to accommodate all road users, workers, and equipment
  
  – Minimize impacts on road users
  
  – Provide clear guidance to road users
  
  – Routinely inspect TTC devices
  
  – Maintain roadside safety
  
  – Train individuals involved in TTC operations
  
  – Disseminate information to public
Section 6B.01 Fundamental Principles of Temporary Traffic Control

Standard:
08 Before any new detour or temporary route is opened to traffic, all necessary signs shall be in place.
09 All TTC devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, TTC devices that are no longer appropriate shall be removed or covered.

- Install signs prior to opening detour or diversion routes
- Remove or cover TTC devices when no longer needed
Coordination should be made between adjacent or overlapping projects to check that duplicate signing is not used and to check compatibility of traffic control between adjacent or overlapping projects.

- **Adjacent or overlapping projects should be coordinated**
DE Guidance: Design based on posted speed limit or 85th-percentile speed

If design is restricted or special conditions exist:

- Speed limit reduction should not exceed 10 mph
- Reduction > 10 mph should be “stepped down”
- DE Guidance: Reductions should be approved by DelDOT Traffic
Constrained work area requires reducing speed limit from 45 mph to 40 mph for lane shifts along SR 2
A planned special event often creates the need to establish altered traffic patterns to handle the increased traffic volumes generated by the event. The size of the TTC zone associated with a planned special event can be small, such as closing a street for a festival, or can extend throughout a municipality for larger events. The duration of the TTC zone is determined by the duration of the planned special event.

**Guidance:**

05 (DE Revision) Any planned special event that impacts traffic flow on state-maintained roadways should complete a Special Event Permit Application, available for download on the DelDOT website at http://www.deldot.gov.

- Planned special events may require TTC planning
- **DE Guidance:** *Complete DelDOT Special Event Permit Application for planned special events on state-maintained roads*
Section 6C.03 Components of Temporary Traffic Control Zones

Figure 6C-1. Component Parts of a Temporary Traffic Control Zone

- **Termination area**
- **Activity area**
- **Transition area**
- **Advance warning area**
Section 6C.04 Advance Warning Area

Varying minimum warning sign spacing for different types of conventional roads

DE Support:
- Roads ≤ 40 mph = “low speed”
- Roads > 40 mph = “high speed”

<table>
<thead>
<tr>
<th>Road Type</th>
<th>OLD</th>
<th>NEW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Distance Between Signs (ft)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Interstate / Expressway / Freeway</td>
<td>1000</td>
<td>1640 (0.3 mi)</td>
</tr>
<tr>
<td>All other roadways</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

Table 6C-1. Suggested Advance Warning Sign Spacing

* The column headings A, B, and C are the dimensions shown in the Case Diagrams (see Section 6H). The A dimension is the distance from the transition distance between the first and second signs. The third sign is the first sign in a three-sign zone.

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Distance Between Signs (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban (low speed)*</td>
<td>100 feet</td>
</tr>
<tr>
<td>Urban (high speed)*</td>
<td>350 feet</td>
</tr>
<tr>
<td>Rural</td>
<td>500 feet</td>
</tr>
<tr>
<td>Interstate / Expressway / Freeway</td>
<td>1,000 feet</td>
</tr>
</tbody>
</table>

* 40 mph or less is “low speed” and over 40 mph is “high speed” on state-maintained roadways.

** The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The “first sign” is the sign in a three-sign series that is closest to the TTC zone. The “third sign” is the sign that is furthest upstream from the TTC zone.)
Section 6C.04 Advance Warning Area

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Distance Between Signs**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Urban (low speed)</td>
<td>100</td>
</tr>
<tr>
<td>Urban (high speed)</td>
<td>250</td>
</tr>
<tr>
<td>Rural</td>
<td>500</td>
</tr>
<tr>
<td>Interstate / Expressway / Freeway</td>
<td>1,600</td>
</tr>
</tbody>
</table>

---

**40 mph or less is “low speed” and over 40 mph is “high speed” on state-maintained roadways. The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The “first sign” is the sign in a three-sign series that is closest to the TTC zone. The “third sign” is the sign that is furthest upstream from the TTC zone.)

Advance warning sign spacing can be reduced to 100 ft for urban, low-speed roads.
Section 6C.04 Advance Warning Area

### Table 6C-1. Recommended Advance Warning Sign Minimum Spacing (Delaware Revision)

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Distance Between Signs**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Urban (high speed)*</td>
<td>350 feet</td>
</tr>
<tr>
<td>Rural</td>
<td>500 feet</td>
</tr>
<tr>
<td>Interstate / Expressway</td>
<td>1,000 feet</td>
</tr>
</tbody>
</table>

*40 mph or less is "low speed" and over 40 mph is "high speed" on state-maintained roadways.

**The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The “first sign” is the sign in a three-sign series that is closest to the TTC zone. The “third sign” is the sign that is furthest upstream from the TTC zone."

Minimum advance warning sign spacing should be 350 ft for urban, high-speed roads.
### Table 6C-1. Recommended Advance Warning Sign Minimum Spacing (Delaware Revision)

<table>
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<th>Road Type</th>
<th>Distance Between Signs**</th>
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<tr>
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<td>500</td>
</tr>
<tr>
<td>Interstate / Expressway / Freeway</td>
<td>1,000</td>
</tr>
</tbody>
</table>

** A 40 mph or less is “low speed” and over 40 mph is “high speed” on state-maintained roadways.

** The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The “first sign” is the sign in a three-sign series that is closest to the TTC zone. The “third sign” is the sign that is furthest upstream from the TTC zone.)

Minimum advance warning sign spacing should be 500 ft on rural roads.

US 13 / DE 404 Intersection Realignment and Bridgeville Service Road
DE Guidance: *Supplemental Flagger signs when flagger assists work vehicles entering and exiting the work area*

*Supplemental FLAGGER AHEAD sign should be installed upstream of flagger station*
Section 6C.06 Activity Area

11 If a longitudinal buffer space is used, the values shown in Table 6C-2 may be used to determine the length of the longitudinal buffer space.

Guidance:

15 (DE Revision) The width of a lateral buffer space should be determined by engineering judgment. On interstates, freeways, or expressways, a lateral buffer space of one travel lane should be used, except where temporary traffic barrier is used to separate the work area from the traveled way, or if other conditions prevent the use of a lateral buffer space.

• Optional longitudinal buffer based on Table 6C-2

• DE Guidance: Lateral buffer of one travel lane on interstates, freeways, and expressways unless behind barrier
L = WS²/60 (S≤40 mph)

L = WS (S>40 mph)

Merging = L

Shifting = L (DE Guidance)

Downstream = 50-100 ft

Shoulder = L/3
• Horizontal curve (per “DelDOT Road Design Manual”) in lieu of shift taper

• DE Guidance: *Shifting taper equal to L*

• DE Option: Minimum shifting taper of 0.5L
Section 6C.08 Tapers

- Merging taper = L

Taper significantly less than L = 320 ft (W=12 ft @ 40 mph)
Section 6C.09 Detours and Diversions

Standard:
01A (DE Revision) All detours affecting state-maintained roadways shall have a detour plan approved by DelDOT Traffic.

Guidance:
01B (DE Revision) Under emergency conditions, personnel should be provided to ensure safe roadway closure until proper devices are in place. Proper devices should be in place within 24 hours of the start of emergency operation.

- DE Standard: Approved detour plan for detours affecting state-maintained roads
- DE Guidance: Emergency personnel provided until TTC devices are in place (within 24 hours)
Section 6D.01 Pedestrian Considerations

- Alternate ped facilities required if TTC affects existing ped facilities

SR 2 at Hazel Ave / VA Hospital
Section 6D.01 Pedestrian Considerations

Not compliant
If an alternate ped route is infeasible, providing free bus service or assigning personnel to assist are options.

Meeting House Rd Pedestrian Improvements

Flaggers will be used to assist pedestrians through the work zone during path reconstruction.

5. DURING PHASE 3, THE CONTRACTOR SHALL MAINTAIN ACCESS FOR PEDESTRIANS THROUGH THE WORK ZONE AS FOLLOWS:
Section 6D.03 Worker Safety Considerations

Guidance:
02A (DE Revision) Workers should not enter unprotected travel lanes of interstates, freeways, or expressways during planned activities, including crossing the roadway to access the median or shoulder on the opposite side from the protected work area.

Standard:
04 (DE Revision) All workers, including emergency responders, within the right-of-way who are exposed either to traffic (vehicles using the highway for purposes of travel) or to work vehicles and construction equipment within the TTC zone shall wear high-visibility safety apparel that meets or exceeds the Performance Class 2 or 3 requirements of the ANSI/ISEA 107–2004 publication entitled “American National Standard for High-Visibility Safety Apparel and Headwear” (see Section 1A.11), or equivalent revisions, and labeled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure, except as provided in Paragraph 5. A person designated by the employer to be responsible for worker safety shall make the selection of the appropriate class of garment.

• DE Guidance: Workers should not enter or cross unprotected lanes on interstates, freeways, or expressways

• ANSI 107-2004 Class 2 apparel (MIN.) for all workers, except flaggers, within right-of-way
Section 6D.03 Worker Safety Considerations

**Guidance:**

04A (DE Revision) For nighttime activity and work on roadways with posted or statutory speeds of 50 mph or greater, safety apparel meeting the requirements of ISEA “American National Standard for High-Visibility Apparel” (see Section 1A.11) and labeled as meeting the ANSI 107-2004 standard performance for Class 3 risk exposure should be considered for all non-flagging personnel (instead of the Class 2 safety apparel in the Standard above).

- **DE Guidance:** ANSI 107-2004 Class 3 apparel for all workers within right-of-way during night work on roads ≥ 50 mph
Section 6E.01 Qualifications for Flaggers

Standard:

01A (DE Revision) All flaggers working on state-maintained roadways, except for emergency personnel and law enforcement officers, shall be certified by a DelDOT-recognized flagger certification program. All flaggers, except for emergency personnel and law enforcement officers, shall be required to carry a flagger certification card and photo identification on their person at all times.

DE Standard:

- ATSSA certified
- Required to carry flagger certification card and photo identification at all times

MEMORANDUM

TO: All Users of the Delaware Manual on Traffic Control Devices
VIA: Don Weber, P.E.
Chief Traffic Engineer
FROM: Adam Weiser, P.E., PTOE
Safety Programs Manager
DATE: March 1, 2011
SUBJECT: Acceptable Flagger Certification

Section 6E.01 of the Delaware Manual on Uniform Traffic Control Devices (MUTCD) provides the following standard statement:

“A flagger shall be a person who provides TTC. All flaggers, except for emergency personnel and law enforcement officers, shall be certified by a DelDOT-recognized flagger certification program. All flaggers, except for emergency personnel and law enforcement officers, shall be required to carry a flagger certification card and photo identification on their person at all times.”

The purpose of this memorandum is to define the DelDOT-recognized flagger certification program. As of the above date, the only DelDOT-recognized flagger certification program is the American Traffic Safety Services Association (ATSSA) Flagger Certification Program. Only flaggers with ATSSA flagger certification shall provide flagging operations on state maintained roadways for construction, maintenance and/or utility projects.

This memorandum, effective immediately, supersedes any previous allowances for other flagger certification beyond the ATSSA Flagger Certification Program.

Please contact the Traffic Safety Section at (302) 659-4060 for questions regarding this information.
Standard:

01 (DE Revision) For daytime and nighttime activity, flaggers shall wear high-visibility safety apparel that meets or exceeds the Performance Class 3 requirements of the ANSI/ISEA 107–2004 publication entitled “American National Standard for High-Visibility Apparel and Headwear” (see Section 1A.11) and labeled as meeting the ANSI 107–2004 standard performance for Class 3 risk exposure. The apparel background (outer) material color shall be fluorescent orange-red, fluorescent yellow-green, or a combination of the two as defined in the ANSI standard. The retroreflective material shall be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 1,000 feet. The retroreflective safety apparel shall be designed to clearly identify the wearer as a person.

- DE Standard: ANSI 107-2004 Class 3 apparel for all flaggers (day and night)
Section 6E.03 Hand-Signaling Devices

Standard:

02 (DE Revision) The STOP/SLOW paddle shall have an octagonal shape on a rigid handle. STOP/SLOW paddles shall be at least 24 inches wide with letters at least 6 inches high. The STOP (R1-1) face shall have white letters and a white border on a red background. The SLOW (W20-8) face shall have black letters and a black border on an orange background. When used at night, the STOP/SLOW paddle shall be retroreflectorized.

- **DE Standard:**
  - **STOP/SLOW paddles shall be 24 inches wide (MIN.)**
  - **Black-on-orange SLOW (W20-8) face**

Non-compliant STOP/SLOW paddle
DelDOT may consider issuing a formal policy when AFADs are permitted on state-maintained roads.
Section 6E.07 Flagger Procedures

Improper flagging procedure
Section 6E.08 Flagger Stations

Standard:
04 Except in emergency situations, flagger stations shall be preceded by an advance warning sign or signs. Except in emergency situations, flagger stations shall be illuminated at night.

05 (DE Revision) Except in emergency situations, flagger stations shall be illuminated at night with a minimum average horizontal luminance of 50 lux (5 foot candles).

Support:
06 (DE Revision) A horizontal luminance of 50 lux (5 foot candles) can typically be achieved by a light plant featuring four (4) 1000 watt metal halide light fixtures, positioned within 15 feet of the flagging station at a minimum mounting height of 15 feet.

Guidance:
07 (DE Revision) For flagger operations at night, a minimum of one (1) light plant should be dedicated to the flagger operation. Light fixtures should be positioned so as not to cause glare problems for vehicles approaching from any direction.

- **Upstream advance warning sign(s)**

- **Illuminated at night (DE Standard: 5 foot candles min. avg.), except emergencies**

- **DE Guidance: 1 light plant (MIN.) exclusively for flagger station**
Section 6F.01 Types of Devices

(De Revision) Information on the maintenance of TTC devices is contained in “Quality Guidelines for Work Zone Traffic Control Devices”, published by the American Traffic Safety Services Association (ATSSA) and is available at the ATSSA website “http://www.atsa.com”.
Section 6F.02 General Characteristics of Signs

Standard:
18  (DE Revision) All TTC signs, including those made of flexible material (i.e. roll-up signs), shall be made of prismatic retroreflective sign sheeting.
19  (DE Revision) Flexible signs made of mesh material shall not be used for TTC operations within the State of Delaware.

DE Standard:
- Prismatic, retroreflective sheeting used for all TTC signs
- Mesh flexible signs prohibited
DE Guidance: Owner’s name and contact information on back of sign.
Section 6F.03 Sign Placement

Guidance:

01 Signs should be located on the right-hand side of the roadway unless otherwise provided in this Manual.

02 (DE Revision) Typically, on multi-lane divided highways, signs should be placed on both the left-hand and right-hand sides of the roadway.

• **Right-hand side of road**

• DE Guidance: *Signs installed on left and right-hand side of multi-lane, divided highways*

*Should be located on right-hand side of road*

*US 13 / DE 404 Intersection Realignment and Bridgeville Service Road*
Section 6F.03 Sign Placement

Standard:
04 **(DE Revision)** The minimum height, measured vertically from the bottom of the sign to the elevation of the near edge of the pavement, of signs installed at the side of the road in rural areas shall be 7 feet (see Figure 6F-1).

05 The minimum height, measured vertically from the bottom of the sign to the top of the curb, or in the absence of curb, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way, of signs installed at the side of the road in business, commercial, or residential areas where parking or pedestrian movements are likely to occur, or where the view of the sign might be obstructed, shall be 7 feet (see Figure 6F-1).

06 The minimum height, measured vertically from the bottom of the sign to the sidewalk, of signs installed above sidewalks shall be 7 feet.

- **DE Standard:** 7-ft (MIN.) mounting height along rural roads
- 7-ft (MIN.) mounting height along urban roads
- 7-ft (MIN.) mounting height above sidewalks
Section 6F.03 Sign Placement

Sign post spacing and lateral offset should comply with Figure 6F-1

Mounting height shall comply with Figure 6F-1

S. Governors Ave, Webbs Ln to Water St
Section 6F.03 Sign Placement

DE Guidance: 5-ft (MIN.) portable sign mounting height ≤ 3 days

DE Guidance: 1-ft (MIN.) portable sign mounting height ≤ 1 hr

Portable signs with a mounting height < 5 ft should be in place for 1 hr or less

S. Governors Ave, Webbs Ln to Water St

BR 1-325 on Otts Chapel Rd over Persimmon Run
Section 6F.03 Sign Placement

Standard:
19  (DE Revision) When portable signs are no longer in use, the signs and their supports shall be removed or placed behind positive protection.

• DE Standard: **Remove or place behind positive protection when not in use**

SR 1 north of SR 16
Section 6F.05 Regulatory Sign Authority

Standard:
02 Regulatory signs shall be authorized by the public agency or official having jurisdiction and shall conform with Chapter 2B.

Guidance:
03 (DE Revision) A Traffic Control Device Authorization should be approved by DelDOT Traffic prior to the installation of a TTC regulatory sign or modification to an existing TTC regulatory sign.

**DE Guidance: Traffic Control Device Authorization approved by DelDOT Traffic for modifications to regulatory conditions**

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**TRAFFIC CONTROL DEVICE AUTHORIZATION**

Bethel Church Rd (N433) SR286
New Castle County

WHEREAS, The Secretary of the Department of Transportation by letter dated January 12, 1971, granted authority of the Chief Traffic Engineer to draw up and validate such restrictions as are needed to provide for the movement of traffic related to construction and maintenance projects; and

WHEREAS, it has been determined that the following traffic control devices are necessary for the safe movement of traffic in the area noted:

Reduce 45 mph to 30 mph Speed Limit on the temporary portion of Bethel Church Rd (N433) SR286. The speed limit reduction will be established on the temporary roadway, beginning at a point 584 feet west of the existing intersection of Bethel Church Rd and Choptank Rd SR15 to a point 780 feet north of the same intersection. The speed limit will be applied in both directions the time that the project demands to support State contract #22-120-01.

This reduced speed limit will be implemented 24 hours a day, and remain in effect from the beginning of the project until the end of the construction of the project.

NOW, THEREFORE, BE IT RESOLVED, by authority so granted, that the speed limit signs noted above were declared approved and effective when properly posted.

Signed authorization on file for speed reduction from 45 mph to 30 mph on temporary road.

SR 15, Choptank Rd from N437 to N433

Date: 9/26/09

Donald D. Weber, P.E.
Chief Traffic Engineer
Section 6F.12 Work Zone and Higher Fines
Signs and Plaques

Guidance:

02 A BEGIN HIGHER FINES ZONE (R2-10) sign (see Figure 6F-3) should be installed at the upstream end of a work zone where increased fines are imposed for traffic violations, and an END HIGHER FINES ZONE (R2-11) sign (see Figure 6F-3) should be installed at the downstream end of the work zone.

04A (DE Revision) The BEGIN HIGHER FINES ZONE sign and FINES HIGHER plaque may be omitted within TTC zones per §4105 of Title 21 of the Delaware Code.

• Occasionally used in work zones because fines are doubled per DE Code

• DE Option: May be omitted within TTC zones per DE Code
Section 6F.16 Warning Sign Function, Design, and Application

Standard:

02 (DE Revision) TTC warning signs shall comply with the Standards for warning signs presented in Part 2 and in FHWA’s “Standard Highway Signs and Markings” book (see Section 1A.11). Except as provided in Paragraph 3, TTC warning signs shall be diamond-shaped with a black legend and border on an fluorescent orange background, except for the W10-1 sign which shall have a black legend and border on a yellow background, and except for signs that are required or recommended in Parts 2 or 7 to have fluorescent yellow-green backgrounds.

• **DE Standard:** TTC warning signs consisting of black legend on fluorescent orange sheeting
DE Guidance: Specific TTC “application” signs should not conflict with “permanent” advance warning signs.

Elkton Rd, Casho Mill Rd to Delaware Ave
Option:
01 An EXIT OPEN (E5-2) or EXIT CLOSED (E5-2a) sign (see Figure 6F-5) may be used to supplement other warning signs where work is being conducted in the vicinity of an exit ramp and where the exit maneuver for vehicular traffic using the ramp is different from the normal condition.

Guidance:
02 When an exit ramp is closed, an EXIT CLOSED sign panel with a black legend and border on an orange background should be placed diagonally across the interchange/intersection guide signs.

- EXIT CLOSED sign panels placed diagonally across guide signs

Similar guidance used for on-ramp closures

I-95 Newark Toll Plaza Highway Speed E-ZPass Lanes
Standard:

01 (DE Revision) The LOW SHOULDER (W8-9) and Shoulder Drop Off (W8-17) signs (see Figure 6F-4) shall be used in accordance with Table 6G-1.

02 (DE Revision) The UNEVEN LANES (W8-11) sign (see Figure 6F-4) shall be used in accordance with Table 6G-1.

- Used in accordance with Table 6G-1: Vertical Difference

Table 6G-1. Vertical Difference (Delaware Revision)

<table>
<thead>
<tr>
<th>Type of Vertical Difference</th>
<th>Criteria</th>
<th>1 in &lt; H ≤ 2 in</th>
<th>2 in &lt; H ≤ 6 in</th>
<th>H &gt; 6 in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>No channelizing devices required</td>
<td>- For differences along or between traveled ways, the UNEVEN LANES (W8-11) sign shall be used.</td>
<td>- For differences between the traveled way and shoulder or at the edge of pavement, the LOW SHOULDER (W8-9) sign shall be used.</td>
<td>- No shoulder or shoulder &lt; 4 ft wide. If the vertical difference is not eliminated by the end of the work day, a 4 to 1 filet of wedge material shall be placed or temporary traffic barrier shall be installed. During the day of construction, channelizing devices shall be used to delineate the vertical difference until the vertical difference is eliminated, a 4 to 1 filet of wedge material is placed, or temporary traffic barrier is installed.</td>
</tr>
<tr>
<td>Longitudinal ≤ 10 ft from edge of traveled way</td>
<td>- The Shoulder Drop Off (W8-17) sign shall be used until the vertical difference is eliminated.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 6F.48 Reverse Curve Signs

Guidance:

01 **(DE Revision)** In order to give road users advance notice of a lane shift, a Reverse Curve (W1-4, W1-4b, or W1-4c) sign or LANE SHIFT XX FT (W1-4-DE) sign (see Figure 6F-4) should be used when a lane (or lanes) is being shifted to the left or right. If the design speed of the curves is 30 mph or less, a Reverse Turn (W1-3) sign should be used.

Standard:

02 If a Reverse Curve (or Turn) sign is used, the direction of the reverse curve (or turn) shall be appropriately illustrated. Except as provided in Paragraph 3, the number of lanes illustrated on the sign shall be the same as the number of through lanes available to road users.

Option:

03 Where two or more lanes are being shifted, a W1-4 (or W1-3) sign with an ALL LANES (W24-1cP) plaque (see Figure 6F-4) may be used instead of a sign that illustrates the number of lanes.

04 Where more than three lanes are being shifted, the Reverse Curve (or Turn) sign may be rectangular.

- Optional DE-specific W1-4-DE legend sign
- **W1-4 sign depicts number of travel lanes**
- May use ALL LANES plaque in place of sign depicting number of lanes
Besides the warning signs specifically related to TTC zones, several other warning signs in Part 2 may apply in TTC zones.

(De Revision) When shoulder or lane closures affect bicycle facilities, the Bicycle Warning (W11-1) sign and Share the Road (W16-1P) plaque may be used to warn of unexpected entries by bicycles into the roadway.

- Other warning signs in Part 2 may be applicable to TTC operations
- Bicycle warning (W11-1) sign with SHARE THE ROAD (W16-1P) plaque used when TTC affects existing bicycle facility
DE Option: Special (custom legend) detour signs used on roads that intersect a closed road

DE Guidance:

- 6-inch (MIN.) legend on two-lane roads and multi-lane roads $\leq 40$ mph
- 8-inch (MIN.) legend on multi-lane roads $> 40$ mph
Section 6F.60 Portable Changeable Message Signs

Standard:

07 Portable changeable message signs shall comply with the applicable design and application principles established in Chapter 2A. Portable changeable message signs shall display only traffic operational, regulatory, warning, or guidance information, and shall not be used for advertising messages.

07A (DE Revision) All portable changeable message signs to be placed within State Right of Way and the messages they display shall be approved by DelDOT Traffic prior to installation, except those used for emergency operations.

Support:

07b (DE Revision) The Portable Changeable Message Sign Approval Form can be found on the DelDOT website at www.deldot.gov.

- Design principles per Chapter 2A

- Display only operational, regulatory, warning, or guidance information

- DE Standard: **Installations approved by DelDOT Traffic**

  - PCMS approval form if display messages are omitted from plan set
Word messages in all upper-case, unless otherwise stated
Table 1A-2 lists acceptable PCMS abbreviations.

<table>
<thead>
<tr>
<th>Word Message</th>
<th>Standard Abbreviation</th>
<th>Prompt Word That Should Precede the Abbreviation</th>
<th>Prompt Word That Should Follow the Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>ACD</td>
<td>Road</td>
<td></td>
</tr>
<tr>
<td>Ahead</td>
<td>AHD</td>
<td>Fog</td>
<td></td>
</tr>
<tr>
<td>Blocked</td>
<td>BLKD</td>
<td>Lane</td>
<td></td>
</tr>
<tr>
<td>Bridge</td>
<td>BR [Name]</td>
<td>Lane</td>
<td></td>
</tr>
<tr>
<td>Cannot</td>
<td>CNT</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Center</td>
<td>CNTR</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Chemical</td>
<td>CHEM</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Condition</td>
<td>COND</td>
<td>Traffic</td>
<td>--</td>
</tr>
<tr>
<td>Congested</td>
<td>CONG</td>
<td>Traffic</td>
<td>--</td>
</tr>
<tr>
<td>Construction</td>
<td>CONST</td>
<td>--</td>
<td>Ahead</td>
</tr>
<tr>
<td>Crossing</td>
<td>XING</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Do Not</td>
<td>DONT</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Downtown</td>
<td>DWNTN</td>
<td>Traffic</td>
<td>--</td>
</tr>
<tr>
<td>Exit</td>
<td>EX</td>
<td>Next</td>
<td></td>
</tr>
<tr>
<td>Express</td>
<td>EXP</td>
<td>Lane</td>
<td></td>
</tr>
<tr>
<td>Frontage</td>
<td>FRNTG</td>
<td>Road</td>
<td></td>
</tr>
<tr>
<td>Highway-Rail Grade Crossing</td>
<td>RR XING</td>
<td>--</td>
<td>[Number]</td>
</tr>
<tr>
<td>It Is</td>
<td>IT</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Lane</td>
<td>LN</td>
<td>[Roadway Name] Right, Left, Center</td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>LFT</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>LOCC</td>
<td>--</td>
<td>Traffic</td>
</tr>
<tr>
<td>Lower</td>
<td>LWR</td>
<td>Level</td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td>MAINT</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Major</td>
<td>MAJ</td>
<td>Accident</td>
<td></td>
</tr>
<tr>
<td>Mirror</td>
<td>MINR</td>
<td>--</td>
<td>Accidental</td>
</tr>
<tr>
<td>Normal</td>
<td>NOR</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Northbound</td>
<td>N-BND</td>
<td>Load</td>
<td></td>
</tr>
<tr>
<td>Oversized</td>
<td>OVRSL</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Parking</td>
<td>PKRS</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Pavement</td>
<td>PWM</td>
<td>Wet</td>
<td></td>
</tr>
<tr>
<td>Prepare</td>
<td>PRP</td>
<td>To Stop</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>QLTY</td>
<td>Air</td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>RT</td>
<td>Keep, Next</td>
<td>--</td>
</tr>
<tr>
<td>Right</td>
<td>RT</td>
<td>Lane</td>
<td></td>
</tr>
<tr>
<td>Roadwork</td>
<td>RWD</td>
<td>--</td>
<td>[Pavement Abbreviation Determined by Highway Agency]</td>
</tr>
<tr>
<td>Service</td>
<td>SERV</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Shoulder</td>
<td>SHOUL</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Slip</td>
<td>SLIP</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Southbound</td>
<td>SBND</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Speed</td>
<td>SPD</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>State, county, or other non-US or non-fipsic numbered route</td>
<td>FIPS Abbreviation (determined by highway agency)</td>
<td>[Number]</td>
<td></td>
</tr>
<tr>
<td>Time With Lugs</td>
<td>LUGS</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Traffic</td>
<td>TRAFF</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Traverses</td>
<td>TRFRS</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Two-Wheeled Vehicles</td>
<td>CYCLES</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>UPR</td>
<td>--</td>
<td>Level</td>
</tr>
<tr>
<td>Vehicle(s)</td>
<td>VEH, VEH(s)</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Warning</td>
<td>WARN</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Westbound</td>
<td>WBND</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>With Next</td>
<td>WONT</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

* This abbreviation, when accompanied by the prompt word, may be used on traffic control devices other than portable changeable message signs.
** A space and no dash shall be placed between the abbreviation and the number of the route.
Section 6F.60 Portable Changeable Message Signs

Guidance:

27 Portable changeable message signs should be used as a supplement to and not as a substitute for conventional signs and pavement markings.

30 (DE Revision) Portable changeable message signs should be placed off the shoulder of the roadway and behind a traffic barrier, if practical. Where a traffic barrier is not available to shield the portable changeable message sign, it should be placed off the shoulder and outside of the clear zone.

• Supplement conventional signs and markings

• Not crashworthy; placed behind barrier or outside clear zone, if practical

I-295 northbound north of I-95 diverge
Section 6F.60 Portable Changeable Message Signs

**Guidance:**

13. A portable changeable message sign should be limited to three lines of eight characters per line or should consist of a full matrix display.
17. Messages on a portable changeable message sign should consist of no more than two phases, and a phase should consist of no more than three lines of text. Each phase should be capable of being understood by itself, regardless of the order in which it is read. Messages should be centered within each line of legend. If more than one portable changeable message sign is simultaneously legible to road users, then only one of the signs should display a sequential message at any given time.

30B (DE Revision) Six (6) channelizing devices (drums or cones) shall be provided to close the shoulder in advance of each portable changeable message sign located within the shoulder during the daytime. When a portable changeable message sign will be on site at night, drums shall be utilized.
32B (DE Revision) All portable changeable message signs no longer in use shall be removed from the work area within 48 hours, unless approved by DelDOT Traffic.

- **Maximum message criteria:**
  - 2 phases per PCMS
  - 3 lines per phase
  - 8 characters per line

- **DE Standard:** **6 drums close shoulder in advance of PCMS**
- **DE Standard:** **PCMSs no longer in use removed within 48 hrs**
6 drums shall be used to close shoulder in advance of PCMS
Section 6F.60 Portable Changeable Message Signs

Guidance:
30c (DE Revision) If a portable changeable message sign is placed on the median of a divided roadway and is less than 30 feet from either direction of travel, the portable changeable message sign should be delineated with 6 drums in that direction of travel.

- DE Guidance: *6 drums in each direction within median of divided highway if PCMS is within 30 ft of travel lane*
Section 6F.61 Arrow Boards

08A (DE Revision) A One-Direction Large Arrow (W1-6) sign shall be centered below and attached to the bottom of all trailer-mounted arrow boards.

08B (DE Revision) The One-Direction Large Arrow (W1-6) sign shall point in the direction that traffic should merge and shall be covered or removed when not in use or when caution mode is being displayed on the trailer mounted arrow board.

• DE Standard: **W1-6 sign shall match direction of arrow board**

• DE Standard: **W1-6 sign removed or covered during caution mode**
Section 6F.61 Arrow Boards

An arrow board shall have the following three mode selections:
A. A Flashing Arrow, Sequential Arrow, or Sequential Chevron mode;
B. A Flashing Double Arrow mode; and
C. A Flashing Caution or Alternating Diamond mode.

Guidance:
16A (DE Revision) Only the Flashing Arrow or Flashing Caution operating modes should be used on state-maintained roadways.

Arrow boards shall only be used to indicate a lane closure. Arrow boards shall not be used to indicate a lane shift.

### Figure 6F-6. Advance Warning Arrow Board Display Specifications (Delaware Revision)

<table>
<thead>
<tr>
<th>Operating Mode</th>
<th>Display (Type C arrow board illustrated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. At least one of the three following modes shall be provided:</td>
<td>![Merge Right] ![Merge Right] ![Merge Right]</td>
</tr>
<tr>
<td>Flashing Arrow</td>
<td>![Merge Right] ![Merge Right] ![Merge Right]</td>
</tr>
<tr>
<td>Sequential Arrow</td>
<td>![Merge Right] ![Merge Right] ![Merge Right]</td>
</tr>
<tr>
<td>Sequential Chevron</td>
<td>![Merge Right] ![Merge Right] ![Merge Right]</td>
</tr>
<tr>
<td>2. The following mode shall be provided:</td>
<td>![Merge Right or Left]</td>
</tr>
<tr>
<td>Flashing Double Arrow</td>
<td>![Merge Right or Left]</td>
</tr>
<tr>
<td>3. The following mode shall be provided:</td>
<td>![Flashing Caution]</td>
</tr>
<tr>
<td>Flashing Caution</td>
<td>![Flashing Caution]</td>
</tr>
</tbody>
</table>

- **DE Guidance:** Flashing Arrow or Flashing Caution modes on state-maintained roads
- **Shall not be used for lane shifts**
Section 6F.61 Arrow Boards

Elkton Rd, Casho Mill Rd to Delaware Ave

Flashing Arrow mode used for lane closures along state-maintained roads
• **DE Standard:** Crashworthy devices with retroreflective sheeting displaying similar color day or night

• **DE Guidance:**
  - Prismatic retroreflective sheeting
  - Vertical panels should not be used on state-maintained roads
Section 6F.63 Channelizing Devices

DE Guidance:

- Longitudinal spacing (ft) = Speed limit (mph); 60 ft MAX.
- Spacing of first 4 devices in taper = 25 ft MAX.

25-ft maximum spacing used for first 4 drums in shoulder closure taper in advance of lane closure taper

Elkton Rd, Casho Mill Rd to Delaware Ave
Section 6F.64 Cones

02 (DE Revision) Except as noted in Paragraphs 3A, 3B and 3C, cones shall not be used for nighttime operations. Retroreflectiorization of cones that are 28 to 36 inches in height shall be provided by a 6-inch wide white band located 3 to 4 inches from the top of the cone and an additional 4-inch wide white band located approximately 2 inches below the 6-inch band.

Option:
03A (DE Revision) Due to the unique and temporary nature of traffic management for special events, including complex traffic shifts to accommodate ingress and egress, retroreflective cones may be used at night during planned special events.
03B (DE Revision) Retroreflective cones may be used in lieu of drums during a single nighttime emergency operation.
03C (DE Revision) Retroreflective cones may be used to supplement a mobile striping operation.

• DE Standard: **Shall not be used at night**

• DE Option: May only be used at night during:
  - Special events requiring complex traffic shifts for ingress and egress traffic
  - Emergencies
  - Mobile striping operations to protect wet markings
Section 6F.64 Cones

Shall have retroreflective bands for both day and night work per Section 6F.63

Should have longitudinal spacing ≤ 55 ft, not 80 ft

I-95 Sign Structure Inspection
Option:
06 (DE Revision) Two ballast rings ("tire rings") may be used to minimize drum displacement due to passing vehicles or high winds.

Support:
07 (DE Revision) The use of two ballast rings has been found to minimize the chance a drum could be blown over by a truck or other vehicle passing by at high speed, particularly on roads with posted speed limits of 55 mph or higher, or having the drum blow over due to high winds.

• DE Option: Two ballast rings to minimize drum displacement on high-speed roads or in areas with high winds

Two ballast rings used on drums along I-495 due to high speeds

Interstate Bridge Maintenance, I-495
Section 6F.68 Type 1, 2, or 3 Barricades

Standard:

01A (DE Revision) Type 1 Barricades shall not be used for TTC operations on state-maintained roads.

01B (DE Revision) Type 2 Barricades shall only be used for pedestrian channelization along temporary pedestrian paths. Type 2 Barricades shall not be used to close a roadway, sidewalk or crosswalk.

01C (DE Revision) When used for pedestrian channelization, Type 2 Barricades shall be continuous and the rails shall be mounted in accordance with ADA in order to provide for a cane rail (bottom rail) and hand rail (top rail).

- **DE Standard:**
  - **Type 1 barricades prohibited**
  - **If used, Type 2 barricades for ped diversions only**

Type 1 and Type 2 barricades shall not be used for road closures
Section 6F.68 Type 1, 2, or 3 Barricades

Standard:
19  (DE Revision) Type 3 Barricades used at a road closure shall be placed completely across a roadway, from curb to curb, or from edge of road to edge of road, with the stripes positioned downward toward the center of the roadway.

- DE Standard: At road closure, Type 3 barricades placed completely across roadway with stripes pointing toward center of road

SR 15, Choptank Rd from N437 to N433
Section 6F.68 Type 1, 2, or 3 Barricades

Option:
23  Signs may be installed on barricades (see Section 6F.03).

Guidance:
24  (DE Revision) Signs mounted on Type 3 Barricades should not cover more than 50 percent of the top two rails or 33 percent of the total area of the three rails.

- DE Guidance: Signs should not cover more than 50 percent of top two rails or 33 percent of all three rails

SR 9 at St. Augustine Rd / Bayview Rd
Section 6F.74 Detectable Edging for Pedestrians

Guidance:
02 (DE Revision) When it is determined that a facility should be accessible to and detectable by pedestrians with visual disabilities, a continuously detectable edging should be provided throughout the length of the facility such that it can be followed by pedestrians using long canes for guidance. This edging should protrude at least 6 inches above the surface of the sidewalk or pathway, with the bottom of the edging a maximum of 2 inches above the surface. This edging should be continuous throughout the length of the facility except for gaps at locations where pedestrians or vehicles will be turning or crossing. This edging should consist of a prefabricated or formed-in-place curbing or other continuous device that is placed along the edge of the sidewalk or walkway. This edging should be firmly attached to the ground or to other devices. Adjacent sections of this edging should be interconnected such that the edging is not displaced by pedestrian or vehicular traffic or work operations, and such that it does not constitute a hazard to pedestrians, workers, or other road users.

- Continuous detectable edging provided for accessible temporary facilities
- Extend ≥ 6 in above surface
- Bottom of edging ≤ 2 in above surface

SR 2 at Hazel Ave / VA Hospital
Section 6F.74 Detectable Edging for Pedestrians

Support:

Individual channelizing devices, tape or rope used to connect individual devices, other discontinuous barriers and devices, and pavement markings are not detectable by persons with visual disabilities and are incapable of providing detectable path guidance on temporary or realigned sidewalks or other pedestrian facilities.

Channelizing devices and caution tape are undetectable

Dover Transit Center

Town of Clayton Sidewalk Improvements

Continuous barrier is detectable
Section 6F.77 Pavement Markings

Maintained in long-term stationary zones

Installed prior to opening detour or diversion road

DE Standard: **Conflicting markings, including RPMs, shall be removed or obliterated**

“Blackout” tape used to cover conflicting markings only if tape is approximately same color as pavement

DE Option: Remove RPM lens rather than entire housing
Existing RPM lenses conflict with temporary lane lines
Section 6F.77 Pavement Markings

RPM lenses were removed to avoid conflict with temporary lane lines.

Conflicting lane lines were obliterated.

Existing neutral area channelizing lines and hatching were obliterated because Exit 5 is open to traffic.
“Blackout” tape shall not be used on concrete because it does not match the pavement color.
Section 6F.78 Temporary Pavement Markings

Guidance:

01. **(DE Revision)** Unless justified based on engineering judgment, temporary pavement markings should not remain in place for more than 30 days after the application of the pavement surface treatment or the construction of the final pavement surface on new roadways or over existing pavements.

02. The temporary use of edge lines, channelizing lines, lane-reduction transitions, gore markings, and other longitudinal markings, and the various non-longitudinal markings (such as stop lines, railroad crossings, crosswalks, words, symbols, or arrows), should be in accordance with the State’s or highway agency’s policy.

- **DE Guidance:** *Should not remain in place longer than 30 days*

- **Installed based on DelDOT’s Temporary Pavement Markings Policy**
  - Shall comply with Part 3
  - **Width of longitudinal lines: 4 in MIN.**
  
Section 3B.01 Yellow Center Line Pavement Markings and Warrants

05 A single solid yellow line shall not be used as a center line marking on a two-way roadway.

Single solid yellow center line prohibited on a two-way road per Part 3

S. Governors Ave, Webbs Ln to Water St
Section 6F.78 Temporary Pavement Markings

Minimum width of temporary longitudinal markings is 4 inches per DelDOT’s Temporary Pavement Markings Policy

State St, Millsboro
Standard:

01A (DE Revision) All work-related vehicles and equipment operating within a TTC zone shall be equipped with and display flashing lights.

06 (DE Revision) Flashing lights shall be either a separate large rotating amber beacon or strobe light(s). Flashing lights shall be mounted on the vehicle in such a manner as to be clearly visible for 360 degrees around the vehicle. The flashing lights shall be visible from a distance of not less than 3,000 feet under normal atmospheric conditions at night.

• DE Standard:
  
  - Flashing lights on all work-related vehicles and equipment
  
  - Large rotating amber beacon or strobe light(s) visible for 360 degrees for ≥ 3,000 ft

S. Governors Ave, Webbs Ln to Water St
Section 6F.83 Warning Lights

Guidance:
01A (DE Revision) Except as provided in Paragraph 1B, warning lights should not be used on state-maintained roads.

Option:
01B (DE Revision) When added conspicuity is desired, only Type B warning lights may be used.

• DE Guidance: 
  Warning lights no longer used on TTC devices

Type B warning lights should not be used on TTC devices (e.g., barricades and temporary traffic barriers)

SR 2 at Hazel Ave / VA Hospital
Section 6F.85 Temporary Traffic Barriers

Guidance:

Because the protective requirements of a TTC situation have priority in determining the need for temporary traffic barriers, their use should be based on an engineering study.

- Use of temporary traffic barrier based on engineering study

Movable barrier provides positive protection for nighttime double lane closure

Movable barrier provides shoulder closure during non-working hours

I-95 Median Barrier Replacement
DelDOT DGM 1-21 provides guidance for use of positive protection in work zones

- Work area with no escape route
- Long-term stationary projects
- Vertical differences (Table 6G-1)
- Storage of equipment (Table 6G-2)
Section 6F.85 Temporary Traffic Barriers

Standard:

Temporary traffic barriers shall be supplemented with standard delineation, pavement markings, or channelizing devices for improved daytime and nighttime visibility if they are used to channelize vehicular traffic. The delineation color shall match the applicable pavement marking color.

Standard:

0S (DE Revision) For enhanced conspicuity, non-directional retroreflective panels (see Figure 6F-8) shall be 6-inch wide and 12-inch high with rounded corners. The non-directional retroreflective panel shall have fluorescent orange, prismatic retroreflective sheeting on both sides.

0E (DE Revision) When used, non-directional retroreflective panels shall be placed at 50-foot intervals. The first panel shall be mounted within 10 feet of the leading edge of barrier.

DE Standard:

- Enhanced conspicuity, non-directional retroreflective panels used to delineate barrier
- 50-ft panel spacing; first panel within 10 ft of leading edge

Elkton Rd, Casho Mill Rd to Delaware Ave
Section 6F.85 Temporary Traffic Barriers

Guidance:
05A (DE Revision) Prior to installation, temporary Portland cement concrete traffic barrier should be painted white on the side adjacent to traffic. If the temporary Portland cement concrete traffic barrier is in place longer than one year, the temporary Portland cement concrete traffic barrier should be painted white on the side adjacent to traffic once per year until the barrier is no longer needed and removed from the roadway.

Option:
05B (DE Revision) Temporary Portland cement concrete traffic barrier manufactured with white cement may be used to eliminate the need for painting the temporary Portland cement concrete traffic barrier.

Guidance:
05C (DE Revision) Temporary traffic barriers should be cleaned once every three months while in place on the roadway unless otherwise directed by DelDOT Traffic. Cleaning of the temporary traffic barrier during winter months should be completed in a manner that does not create ice on the roadway.

• DE Guidance:
  – Painted prior to initial installation and once per year
  – Cleaned every 3 months

• DE Option: White cement barrier does not require painting
Temporary traffic barriers, including their end treatments, shall be crashworthy. In order to mitigate the effect of striking the upstream end of a temporary traffic barrier, the end shall be installed in accordance with AASHTO’s “Roadside Design Guide” (see Section 1A.11) by flaring until the end is outside the acceptable clear zone or by providing crashworthy end treatments.

- **Barrier and corresponding end treatment shall be crashworthy**

- **End treatments per AASHTO “Roadside Design Guide”**
  - Flare end outside clear zone
  - Install crashworthy cushion

**Drums are not compliant barrier end treatments**

Milton Rail to Trail Conversion
Guidance:

06E (DE Revision) On state-maintained roads with a posted or 85th percentile speed greater than 40 mph, the rate of taper for the flare of a traffic barrier should be 17:1. If space constraints limit the length of flare, a minimum taper rate of 11:1 should be used.

06F (DE Revision) When space permits, the leading edge of the attenuator/barrier should have a lateral offset of at least 12 feet from the traveled way.

06H (DE Revision) When space permits, channelizing devices should be placed along the tangent section of the traveled way for a distance equal to the buffer space measured from the intersection of the barrier and the right-hand edge of the closed travel lane (see Figure 6H-34).

• DE Guidance:
  
  – 17:1 flare rate
  
  – 12 ft MIN. lateral offset at leading edge
  
  – Buffer space along tangent
Section 6F.85 Temporary Traffic Barriers

06G (DE Revision) If unpinned barrier is used, a lateral offset of at least 5 feet should be provided between the barrier and the work area. Consideration should be given to pinning the barrier if work is performed within 5 feet of the barrier.

• DE Guidance: Consider pinned barrier if working < 5 ft behind barrier
Leading edge of barrier should be offset full width of shoulder
Section 6F.85 Temporary Traffic Barriers

New typical applications depicting barrier applications
Section 6F.86 Crash Cushions

- **DE Guidance:** *Sand crash cushions generally reserved for short-duration maintenance*

- **DE Guidance:** *Sand crash cushions should not be installed where reverse strikes are possible*
Impact attenuators should be installed per manufacturer’s instructions (to avoid “snagging” motorists)
Section 6F.86 Crash Cushions

05A (DE Revision) For long-term, intermediate-term, short-term, and mobile operations requiring shoulder and/or lane closures, a truck-mounted attenuator shall be used on roadways with a posted speed limit or 85th-percentile speed greater than 40 miles per hour, except as provided in Paragraphs 5B, 5C and 5F.

Option:

05B (DE Revision) For short-duration operations of 15 minutes or less along roadways with a posted speed limit or 85th-percentile speed greater than 40 miles per hour, a truck-mounted attenuator may be omitted if a vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used or if the shoulder width is less than the width of a truck-mounted attenuator.

05C (DE Revision) Truck-mounted attenuators may be omitted from specialized work vehicles, such as sweeper, vacuum, and pothole patching trucks, and other work vehicles that cannot support the installation of a truck-mounted attenuator.

05D (DE Revision) Truck-mounted attenuators may be used for all operations along roadways with a posted speed limit or 85th-percentile speed less than or equal to 40 miles per hour based on engineering judgment.

- **DE Standard:** Truck-mounted attenuator (TMA) required for shoulder and lane closures for long-term, intermediate, short-term, and mobile operations on roads > 40 mph

- **DE Option:** TMA can be omitted for short duration work less than 15 min if vehicle displays high-intensity, flashing, oscillating, or strobe lights

- **DE Option:** TMA can be omitted from specialized work vehicles that cannot support TMA installation
Section 6G.02 Work Duration

Support:
01 Work duration is a major factor in determining the number and types of devices used in TTC zones. The duration of a TTC zone is defined relative to the length of time a work operation occupies a spot location.

Standard:
02 The five categories of work duration and their time at a location shall be:
A. Long-term stationary is work that occupies a location more than 3 days.
B. Intermediate-term stationary is work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour.
C. Short-term stationary is daytime work that occupies a location for more than 1 hour within a single daylight period.
D. Short duration is work that occupies a location up to 1 hour.
E. Mobile is work that moves intermittently or continuously.

• Long-term stationary: > 3 days
• Intermediate stationary: > 1 daylight period or 1 hr at night
• Short-term stationary: > 1 hr within single daylight period
• Short duration: ≤ 1 hr
• Mobile: Moving intermittently or continuously
Sections 6G.05 – 6G.19

- Primarily support and guidance material for Typical Applications in Chapter 6H
**DE Standard: Vertical difference treatments based on Table 6G-1 criteria**

### Table 6G-1. Vertical Difference (Delaware Revision)

<table>
<thead>
<tr>
<th>Type of Vertical Difference</th>
<th>Criteria</th>
<th>Height H of Vertical Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>H ≤ 1 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 in ≤ H 2 in</td>
</tr>
<tr>
<td>Standard</td>
<td>No channelizing devices required</td>
<td>- For differences along or between traveled ways, the LANE END (W-11) sign shall be used. - For differences between the traveled way and shoulder or at the edge of pavement, the LOW SHOULDER (W-9) sign shall be used.</td>
</tr>
<tr>
<td>Guidance</td>
<td>No channelizing devices required</td>
<td>- For differences between the traveled way and shoulder or at the edge of pavement, wedge material is not required if the vertical difference exists for less than 5 calendar days. If the vertical difference is not eliminated by the end of the 5th calendar day, a 4 to 1 ft of wedge material should be placed. - Throughout the duration of the vertical difference condition, drums should be placed between the traveled way and shoulder or at the edge of pavement.</td>
</tr>
<tr>
<td>Longitudinal &lt; 6 ft from edge or traveled way</td>
<td>No channelizing devices required</td>
<td>No channelizing devices required</td>
</tr>
<tr>
<td>Standard</td>
<td>No channelizing devices required</td>
<td>- Throughout the duration of the vertical difference condition, drums shall be placed between the traveled way and shoulder or at the edge of pavement.</td>
</tr>
<tr>
<td>Guidance</td>
<td>No channelizing devices required</td>
<td>- Except for roadway obstacles such as manholes and utility valves, BUMP (W-1) or DIAP (W-2) signs shall be installed</td>
</tr>
<tr>
<td>Transverse Standard</td>
<td>No channelizing devices required</td>
<td>- A ramp of obstructions temporary roadway material shall be installed at a slope of 20 to 1 across the limits of the vertical difference, including the curbing or any obstructs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Per Section 14.12, the traveled way is defined as the portion of the roadway for the movement of vehicles, exclusive of the shoulders, berms, sidewalks, and parking lanes.
2. Channelizing devices are not required if the vertical difference is located behind guardrail, barrier, or vertical curve.
### Section 6G.20 Vertical Difference

<table>
<thead>
<tr>
<th>Type of Vertical Difference</th>
<th>Criteria</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No channelizing devices required</td>
<td>H ≤ 1 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 in &lt; H ≤ 2 in</td>
</tr>
<tr>
<td>Standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- For differences along or between traveled ways, the UNEVEN LINES (W8-11) sign shall be used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- For differences between the traveled way and shoulder or at the edge of pavement, the LOW SHOULDER (W8-9) sign shall be used</td>
<td></td>
</tr>
</tbody>
</table>

**UN EVEN LINES**

W8-11

US 113 south of Milford
### Section 6G.20 Vertical Difference

<table>
<thead>
<tr>
<th>Type of Vertical Difference</th>
<th>Criteria</th>
<th>Height (H) of Vertical Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>H ≤ 1 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 in &lt; H ≤ 2 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 in &lt; H ≤ 6 in</td>
</tr>
<tr>
<td>Transverse</td>
<td>Standard</td>
<td>H &gt; 6 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No channelizing devices required</td>
<td>- Except for roadway obstacles such as manholes and utility valves, BUMP (W8-1) or DIP (W8-2) signs shall be installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A ramp of bituminous temporary roadway material shall be installed at a slope of 20 to 1 across the limits of the vertical difference, including the perimeter of an obstacle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A ramp of bituminous temporary roadway material shall be installed at a slope of 20 to 1 across the limits of the vertical difference, including the perimeter of an obstacle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Except for roadway obstacles such as manholes and utility valves, BUMP (W8-1) or DIP (W8-2) signs shall be installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A ramp of bituminous temporary roadway material shall be installed at a slope of 20 to 1 across the limits of the vertical difference, including the perimeter of an obstacle</td>
</tr>
</tbody>
</table>

- **DE Standard:** Bituminous temporary roadway material (TRM) at 20:1 slope around perimeter of transverse obstacle

S. Governors Ave, Webbs Ln to Water St
Section 6G.20 Vertical Difference

- **DE Standard:** Pavement millings (or similar) used for wedge material at edge of pavement

- **DE Guidance:** Base course material used for wedge material between traveled way and pavement box

---

05 (DE Revision) Where a fillet of wedge material is used at the edge of pavement in accordance with Table 6G-1, pavement millings, or a similar suitable material, shall be used for the wedge material.

Guidance:

06 (DE Revision) Where a fillet of wedge material is used between a traveled way and pavement box in accordance with Table 6G-1, base course material should be used for the wedge material and should be placed at no greater than the slope specified in Table 6G-1. The base course material should be compacted after placement.

---

**HSIP NCC, SR 896 and Four Seasons Pkwy Intersection Improvement**
Table 6G-2. Storage of Equipment (Delaware Revision)

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Distance (L) from Edge of Traveled Way</th>
<th>Posted Speed Limit or 85th Percentile Speed</th>
<th>Minimum Required Channelizing Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment and Non-flammable Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate, Freeway, or Expressway</td>
<td>L ≤ 30 ft</td>
<td>All</td>
<td>Temporary traffic barrier</td>
</tr>
<tr>
<td></td>
<td>L &gt; 30 ft</td>
<td>All</td>
<td>Drums</td>
</tr>
<tr>
<td>All other roadways</td>
<td>0 ≤ L ≤ 10 ft</td>
<td>25 mph or less</td>
<td>Drums</td>
</tr>
<tr>
<td></td>
<td>10 ft &lt; L ≤ 30 ft</td>
<td>More than 25 mph</td>
<td>Temporary traffic barrier</td>
</tr>
<tr>
<td></td>
<td>L &gt; 30 ft</td>
<td>More than 25 mph</td>
<td>Drums</td>
</tr>
<tr>
<td>Flammable Materials (fuel, propane, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate, Freeway, or Expressway</td>
<td>L ≤ 30 ft</td>
<td>All</td>
<td>Temporary traffic barrier</td>
</tr>
<tr>
<td></td>
<td>L &gt; 30 ft</td>
<td>All</td>
<td>Drums</td>
</tr>
<tr>
<td>All other roadways</td>
<td>L ≤ 30 ft</td>
<td>All</td>
<td>Temporary traffic barrier</td>
</tr>
</tbody>
</table>
|                                 | L > 30 ft                              | All                                         | None                                  

**DE Standard:** Treated as roadside obstacle per Table 6G-2

Oak Orchard Rd
### Table 6H-1. Index to Typical Applications (Sheet 1 of 2)

<table>
<thead>
<tr>
<th>Typical Application Description</th>
<th>Two-Lane Conventional Road</th>
<th>Multi-Lane Conventional Road</th>
<th>Interstate, Freeway, or Expressway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Outside of the Shoulder (see Section 6G.06)</td>
<td>TA-1A</td>
<td>TA-1A</td>
<td>TA-1A</td>
</tr>
<tr>
<td>Work Beyond the Shoulder &gt; 10 Feet from the Edge of the Travelway</td>
<td>TA-3A</td>
<td>TA-3A</td>
<td>TA-3A</td>
</tr>
<tr>
<td>Work Beyond the Shoulder &gt; 10 Feet from the Edge of the Travelway (see Section 6G.06)</td>
<td>TA-1A</td>
<td>TA-1B</td>
<td>TA-1B</td>
</tr>
<tr>
<td>Blast Zone</td>
<td>TA-3</td>
<td>TA-3</td>
<td>TA-3</td>
</tr>
<tr>
<td>Work on the Shoulder (see Sections 6G.07 and 6G.08)</td>
<td>TA-3</td>
<td>TA-3A</td>
<td>TA-3A</td>
</tr>
<tr>
<td>Short Duration or Mobile Operation on a Shoulder</td>
<td>TA-4</td>
<td>TA-4A</td>
<td>TA-4A</td>
</tr>
<tr>
<td>Shoulder Work with Minor Encroachment</td>
<td>TA-4A</td>
<td>TA-4A</td>
<td>TA-4A</td>
</tr>
<tr>
<td><strong>Work Within the Travelway of a Two-Lane Highway (see Section 6G.10)</strong> (also applicable to other roadway types, as noted)</td>
<td>TA-5</td>
<td>TA-5</td>
<td>TA-5</td>
</tr>
<tr>
<td>Road Work with a Detour</td>
<td>TA-6</td>
<td>TA-6</td>
<td>TA-6</td>
</tr>
<tr>
<td>Road Work with an Off-Site Detour</td>
<td>TA-6A</td>
<td>TA-6A</td>
<td>TA-6A</td>
</tr>
<tr>
<td>Overlapping Routes with a Detour</td>
<td>TA-6B</td>
<td>TA-6B</td>
<td>TA-6B</td>
</tr>
<tr>
<td>Lane Closure on a Two-Lane Road Using Flagger(s)</td>
<td>TA-7</td>
<td>TA-7</td>
<td>TA-7</td>
</tr>
<tr>
<td>Lane Closure on a Two-Lane Road with Low Traffic Volumes</td>
<td>TA-7A</td>
<td>TA-7A</td>
<td>TA-7A</td>
</tr>
<tr>
<td>Divide on a Two-Lane Road with Low Traffic Volumes</td>
<td>TA-7B</td>
<td>TA-7B</td>
<td>TA-7B</td>
</tr>
<tr>
<td>Lane Closure on a Two-Lane Road Using Traffic Control Signal(s)</td>
<td>TA-8</td>
<td>TA-8</td>
<td>TA-8</td>
</tr>
<tr>
<td>Temporary Road Closure</td>
<td>TA-9</td>
<td>TA-9</td>
<td>TA-9</td>
</tr>
<tr>
<td>Street Crossing</td>
<td>TA-10</td>
<td>TA-10</td>
<td>TA-10</td>
</tr>
<tr>
<td>Work in the Center of a Road with Low Traffic Volumes</td>
<td>TA-10A</td>
<td>TA-10A</td>
<td>TA-10A</td>
</tr>
<tr>
<td>Surveying A Two-Lane Road</td>
<td>TA-11</td>
<td>TA-11</td>
<td>TA-11</td>
</tr>
<tr>
<td>Mobile Operations on a Two-Lane Road</td>
<td>TA-11A</td>
<td>TA-11A</td>
<td>TA-11A</td>
</tr>
<tr>
<td>Mobile Signing Operations on a Two-Lane Road</td>
<td>TA-12</td>
<td>TA-12</td>
<td>TA-12</td>
</tr>
<tr>
<td>Road Work within an Urban Street (see Section 6G.11) (also applicable to other roadway types, as noted)</td>
<td>TA-12A</td>
<td>TA-12A</td>
<td>TA-12A</td>
</tr>
<tr>
<td>Lane Closure on a Minor Street</td>
<td>TA-13</td>
<td>TA-13</td>
<td>TA-13</td>
</tr>
<tr>
<td>Detour for One Traffic Direction</td>
<td>TA-14</td>
<td>TA-14</td>
<td>TA-14</td>
</tr>
<tr>
<td>Detour for a Closed Street</td>
<td>TA-15</td>
<td>TA-15</td>
<td>TA-15</td>
</tr>
<tr>
<td>Work Within the Travelway at an Intersection and on Sidewalks (see Section 6G.13)</td>
<td>TA-16</td>
<td>TA-16</td>
<td>TA-16</td>
</tr>
<tr>
<td>Lane Closure on the Near Side of an Intersection</td>
<td>TA-17</td>
<td>TA-17</td>
<td>TA-17</td>
</tr>
<tr>
<td>Right-Hand Lane Closure on the Far Side of an Intersection</td>
<td>TA-18</td>
<td>TA-18</td>
<td>TA-18</td>
</tr>
<tr>
<td>Left-Hand Lane Closure on the Far Side of an Intersection</td>
<td>TA-19</td>
<td>TA-19</td>
<td>TA-19</td>
</tr>
<tr>
<td>Half Road Closure on the Far Side of an Intersection</td>
<td>TA-20</td>
<td>TA-20</td>
<td>TA-20</td>
</tr>
<tr>
<td>Multiple Lane Closures at an Intersection</td>
<td>TA-21</td>
<td>TA-21</td>
<td>TA-21</td>
</tr>
<tr>
<td>Closure in the Center of an Intersection</td>
<td>TA-22</td>
<td>TA-22</td>
<td>TA-22</td>
</tr>
<tr>
<td>Closure at the Side or Center of an Intersection</td>
<td>TA-23</td>
<td>TA-23</td>
<td>TA-23</td>
</tr>
<tr>
<td>Sidewalk Detour or Diversion</td>
<td>TA-24</td>
<td>TA-24</td>
<td>TA-24</td>
</tr>
<tr>
<td>Crosswalk Closures and Pedestrian Detours</td>
<td>TA-25</td>
<td>TA-25</td>
<td>TA-25</td>
</tr>
<tr>
<td>Work Within the Travelway of a Multi-Lane, Non-Access Controlled Highway (see Section 6G.12) (also applicable to other roadway types, as noted)</td>
<td>TA-26</td>
<td>TA-26</td>
<td>TA-26</td>
</tr>
<tr>
<td>Interior Lane Closure on a Multi-Lane Street</td>
<td>TA-27</td>
<td>TA-27</td>
<td>TA-27</td>
</tr>
<tr>
<td>Lane Closure on a Street with Uneven Directional Volumes</td>
<td>TA-28</td>
<td>TA-28</td>
<td>TA-28</td>
</tr>
<tr>
<td>Half Road Closure on a Multi-Lane, High-Speed Highway</td>
<td>TA-29</td>
<td>TA-29</td>
<td>TA-29</td>
</tr>
<tr>
<td>Stationary Lane Closure on a Divided Highway</td>
<td>TA-30</td>
<td>TA-30</td>
<td>TA-30</td>
</tr>
<tr>
<td>Lane Closure with a Temporary Traffic Barrier</td>
<td>TA-31</td>
<td>TA-31</td>
<td>TA-31</td>
</tr>
<tr>
<td>Short Duration and Mobile Operations on a Multi-Lane Road</td>
<td>TA-32</td>
<td>TA-32</td>
<td>TA-32</td>
</tr>
<tr>
<td>Mobile Signing Operations on a Multi-Lane Road</td>
<td>TA-33</td>
<td>TA-33</td>
<td>TA-33</td>
</tr>
</tbody>
</table>

### Table 6H-1. Index to Typical Applications (Sheet 2 of 2)

<table>
<thead>
<tr>
<th>Typical Application Description</th>
<th>Two-Lane Conventional Road</th>
<th>Multi-Lane Conventional Road</th>
<th>Interstate, Freeway, or Expressway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Within the Travelway of an Interstate, Freeway, or Expressway (see Section 6G.14) (also applicable to other roadway types, as noted)</td>
<td>TA-34</td>
<td>TA-34</td>
<td>TA-34</td>
</tr>
<tr>
<td>Lane Shift on a Multi-Lane, Divided Highway</td>
<td>TA-35</td>
<td>TA-35</td>
<td>TA-35</td>
</tr>
<tr>
<td>Median Crossover on a Multi-Lane, Divided Highway</td>
<td>TA-36</td>
<td>TA-36</td>
<td>TA-36</td>
</tr>
<tr>
<td>Median Crossover for an Entrance Ramp</td>
<td>TA-37</td>
<td>TA-37</td>
<td>TA-37</td>
</tr>
<tr>
<td>Median Crossover for an Exit Ramp</td>
<td>TA-38</td>
<td>TA-38</td>
<td>TA-38</td>
</tr>
<tr>
<td>Partial Exit Ramp Closure</td>
<td>TA-40</td>
<td>TA-40</td>
<td>TA-40</td>
</tr>
<tr>
<td>Work in the Vicinity of an Entrance Ramp</td>
<td>TA-41</td>
<td>TA-41</td>
<td>TA-41</td>
</tr>
<tr>
<td>Temporary Reversible Lane Using Movable Barriers</td>
<td>TA-42</td>
<td>TA-42</td>
<td>TA-42</td>
</tr>
</tbody>
</table>

- **Cases are now Typical Applications (TAs)**
- **Table 6H-1 provides index for TAs**
### CHAPTER 6H. TYPICAL APPLICATIONS

- **Off-roadway work**
  - Mowing

- **Shoulder work**

<table>
<thead>
<tr>
<th>Typical Application Description</th>
<th>Typical Application Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Two-Lane Conventional Road</td>
</tr>
<tr>
<td>Work Outside of the Shoulder (see Section 6G.06)</td>
<td></td>
</tr>
<tr>
<td>Work Beyond the Shoulder &gt; 10 Feet from the Edge of the</td>
<td>TA-1</td>
</tr>
<tr>
<td>Traveled Way</td>
<td></td>
</tr>
<tr>
<td>Work Beyond the Shoulder ≤ 10 Feet from the Edge of</td>
<td>TA-3</td>
</tr>
<tr>
<td>the Traveled Way</td>
<td></td>
</tr>
<tr>
<td>Off-Roadway Mowing Operations</td>
<td>TA-1A</td>
</tr>
<tr>
<td>Blasting Zone</td>
<td>TA-2</td>
</tr>
<tr>
<td>Work on the Shoulder (see Sections 6G.07 and 6G.08)</td>
<td></td>
</tr>
<tr>
<td>Work on the Shoulders</td>
<td>TA-3</td>
</tr>
<tr>
<td>Short Duration or Mobile Operation on a Shoulder</td>
<td>TA-4</td>
</tr>
<tr>
<td>Shoulder Work with Minor Encroachment</td>
<td>TA-6 (≤ 40 MPH) or TA-10 (&gt; 40 MPH)</td>
</tr>
</tbody>
</table>
• **Case 1 = TA-1**

• **Additional ROAD WORK AHEAD sign on left-hand side of divided highway when working in median**
• Case 24 = TA-1A

• DE Standard:
  – Performed during daylight hours only
  – Work area limited to 2 miles or less

• DE Guidance: Use mobile shoulder closure (TA-4) or mobile lane closure (TA-17) if mowing encroaches upon shoulder or traveled way
• Case 25 = TA-1B

• DE Standard:
  – Performed during daylight hours only
  – Work area limited to 2 miles or less
  – Signs in both directions when mowing median

• DE Guidance: *Use mobile shoulder closure (TA-4A) or mobile lane closure (TA-35) if mowing encroaches upon shoulder or traveled way*
• Case 2 = TA-3

• At least 1 sign when closing shoulder ≥ 8 ft

• Arrow board(s) in caution mode

• Omit SHOULDER CLOSED on side road if turning motorists will encounter mainline sign

• DE Standard: **Warning signs in opposing direction when closure occurs in passing zone**
Case 3 = TA-3A

On multi-lane, divided highways, shoulder work signs only on side of affected shoulder
Guidance:

03  (DE Revision) When paved shoulders having a width of 8 feet or more are closed on interstates, freeways, and expressways, road users should be warned about potential disabled vehicles that cannot get off the traveled way. An initial general warning sign, such as ROAD WORK AHEAD (W20-1), should be used, followed by a RIGHT or LEFT SHOULDER CLOSED (W21-3a) sign. Where the downstream end of the shoulder closure extends beyond the distance that can be perceived by road users, a supplementary plaque bearing the message NEXT XX FEET (W16-4P) or MILES (W7-3aP) should be placed below the SHOULDER CLOSED (W21-5a) sign. On multi-lane, divided highways, signs advising of shoulder work or the condition of the shoulder should be placed only on the side of the affected shoulder.

• On multi-lane, divided highways, shoulder work signs only on side of affected shoulder

LEFT SHOULDER CLOSED sign should not be installed on right-hand side of multi-lane, divided highway

I-95 Newark Toll Plaza Highway Speed E-ZPass Lanes
• Example of one method for long-term shoulder closure

• Use of barrier based on engineering judgment

• Distance plaques if motorists cannot see downstream pull-off area
• Design criteria in TA-5 may be applicable to other road types for shoulder closures with barrier.

Drums used to channelize shoulder closure on Boulden Blvd in advance of barrier.
• **Case 4 = TA-5A. Work > 10 ft from traveled way**

• **Case 5 = TA-5B. Work ≤ 10 ft from traveled way**

Similar operation as TA-33 due to need for lateral buffer lane
- Case 20-A = TA-4 & TA-4A

- **DE Standard:** TMA required for mobile operations on roads > 40 mph

- **DE Option:** TMA can be omitted for short duration work < 15 min if vehicle displays high-intensity, flashing, oscillating, or strobe lights

- **DE Option:** TMA and arrow board omitted from work vehicles that cannot support devices

- **Arrow board(s) in caution mode**
**Work within traveled way of a two-lane road**

<table>
<thead>
<tr>
<th>Typical Application Description</th>
<th>Typical Application Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Within the Traveled Way of a Two-Lane Highway (see Section 6G.10) – also applicable to other roadway types, as noted</td>
<td></td>
</tr>
<tr>
<td>Road Closed with a Diversion</td>
<td>TA-7</td>
</tr>
<tr>
<td>Roads Closed with an Off-Site Detour</td>
<td>TA-20</td>
</tr>
<tr>
<td>Overlapping Routes with a Detour</td>
<td>TA-20</td>
</tr>
<tr>
<td>Lane Closure on a Two-Lane Road Using Flaggers</td>
<td>TA-10</td>
</tr>
<tr>
<td>Lane Closure on a Two-Lane Road with Low Traffic Volumes</td>
<td>TA-11 or TA-11A</td>
</tr>
<tr>
<td>Lane Diversion on a Two-Lane Road with Low Traffic Volumes</td>
<td>TA-11B</td>
</tr>
<tr>
<td>Lane Closure on a Two-Lane Road Using Traffic Control Signals</td>
<td>TA-12</td>
</tr>
<tr>
<td>Temporary Road Closure</td>
<td>TA-13</td>
</tr>
<tr>
<td>Haul Road Crossing</td>
<td>TA-14</td>
</tr>
<tr>
<td>Work in the Center of a Road with Low Traffic Volumes</td>
<td>TA-15</td>
</tr>
<tr>
<td>Surveying Along a Two-Lane Road</td>
<td>TA-16</td>
</tr>
<tr>
<td>Mobile Operations on a Two-Lane Road</td>
<td>TA-17</td>
</tr>
<tr>
<td>Mobile Striping Operations on a Two-Lane Road</td>
<td>TA-17A or TA-17B</td>
</tr>
</tbody>
</table>
• Case 6 = TA-10

• DE Option: TMA on downstream end of work area

• One-lane, two-way taper now 50 ft to 100 ft

• Downstream taper also 50 ft to 100 ft
TA-10. Lane Closure on a Two-Lane Road using Flaggers

Figure 6H-10. Lane Closure on a Two-Lane Road Using Flaggers (TA-10)
(Delaware Revision)

Typical Application 10

Signs should follow TA-10

SR 18 / SR 404, west of Georgetown
Optional single flagger application reserved for short work zones along low-volume roads.
TA-11 & TA-11A Lane Closure on a Two-Lane Road with YIELD or STOP Signs

- Alternate applications for TA-10 (flagger control) reserved for low-volume roads

**TA-11 requires DelDOT Traffic approval**
TA-11A. Lane Closure on a Two-Lane Road with Low Traffic Volumes using STOP Signs

James St bridge, Newport
Emergency one-lane bridge conversion

Horizontal curve and adjacent intersection restricted use of self-regulating, YIELD control; therefore, STOP control used during bridge repairs
• **Case 10 = TA-11B**

• **DE Option**: Alternative to lane closure where opposing shoulder is travel-bearing and of adequate width

• **DE Guidance:**
  
  – 10-ft (MIN.) lane widths

  – Shift taper = L

  – **Illuminate shift area at night**
• DE Standard: **Require approved signal plan by DelDOT Traffic**

• **Installed and operated in accordance with Part 4**

• DE Guidance: *Primary signal faces located overhead*
Vertical crest curve restricts visibility; temporary signal to be installed during bridge repairs in lieu of 24/7 flagging operations.

**Interstate Bridge Maintenance, North**
Myrtle Ave over I-495
TA-12 requires a DelDOT Traffic approved signal plan.
• Reserve for closures < 20 min during off-peak hours
• **Use flaggers or law enforcement officers**

**DE Standard:**
- **MAX. work area = ½ day’s operation or 1 mile**
- **Flaggers within sight or in communication at all times**
• Case 20-B = TA-17

• DE Standard: **TMAs required for mobile operations on roads > 40 mph**

• DE Option: TMA and arrow board omitted from work vehicles that cannot support devices

• **Arrow board(s) in caution mode**
- Case 23-A = TA-17A
- DE Option: 2 separate convoys (TA-17B) – application and cone recovery
  - TA-17 (mobile lane closure) required for cone recovery convoy
• Work within traveled way of urban street
  – Lane closure on subdivision street
  – Detour

<table>
<thead>
<tr>
<th>Typical Application Description</th>
<th>Typical Application Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Within the Traveled Way of an Urban Street (see Section 6G.11) – also applicable to other roadway types, as noted</td>
<td></td>
</tr>
<tr>
<td>Lane Closure on a Minor Street</td>
<td>TA-18</td>
</tr>
<tr>
<td>Detour for One Travel Direction</td>
<td>TA-20</td>
</tr>
<tr>
<td>Detour for a Closed Street</td>
<td>TA-20</td>
</tr>
<tr>
<td></td>
<td>TA-20</td>
</tr>
<tr>
<td></td>
<td>TA-20</td>
</tr>
<tr>
<td></td>
<td>TA-20</td>
</tr>
</tbody>
</table>
**TA-18. Lane Closure on a Minor Street**

- **DE Standard:** Only for low-speed roads with low traffic volumes, such as subdivision streets

- **Use TA-10 (lane closure with flaggers) where traffic cannot self regulate**

> Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
• Case 15 = TA-20

• DE Guidance:
  – Detour signs on both left and right-hand side of multi-lane, divided roads
  – Street name plaque for complex or overlapping detours
  – 6-inch (MIN.) legend on two-lane roads and multi-lane roads ≤ 40 mph
  – 8-inch (MIN.) legend on multi-lane roads > 40 mph
TA-20. Detour for a Closed Street

• DE Guidance: *Route Sign Directional assemblies for long-term detours on numbered routes*

• *Detour signs with Advance Turn Arrow on multi-lane roads*

Detour assembly with Advance Turn Arrow and Route Sign along SR 896 for long-term detour; should also be installed on left-hand side of multi-lane, divided highway

I-95 Newark Toll Plaza Highway Speed E-ZPass Lanes
• **DE Standard:** Approved detour plan for detours affecting state-maintained roads
TA-20. Detour for a Closed Street

Contradicting Detour signs

Confusing barricade signing at “T” intersection

SR 9 at St. Augustine Rd / Bayview Rd
Work at an intersection and on sidewalks

<table>
<thead>
<tr>
<th>Typical Application Description</th>
<th>Two-Lane Conventional Road</th>
<th>Multi-Lane Conventional Road</th>
<th>Interstate, Freeway, or Expressway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Within the Traveled Way at an Intersection and on Sidewalks (see Section 6G.13)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lane Closure on the Near Side of an Intersection</td>
<td>TA-21 (≤ 40 MPH) or</td>
<td>TA-21 (≤ 40 MPH) or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TA-33 (&gt; 40 MPH)</td>
<td>TA-33 (&gt; 40 MPH)</td>
<td></td>
</tr>
<tr>
<td>Right-Hand Lane Closure on the Far Side of an Intersection</td>
<td>TA-23 (≤ 40 MPH) or</td>
<td>TA-23 (≤ 40 MPH) or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TA-33 (&gt; 40 MPH)</td>
<td>TA-33 (&gt; 40 MPH)</td>
<td></td>
</tr>
<tr>
<td>Left-Hand Lane Closure on the Far Side of an Intersection</td>
<td>TA-23 (≤ 40 MPH) or</td>
<td>TA-23 (≤ 40 MPH) or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TA-33 (&gt; 40 MPH)</td>
<td>TA-33 (&gt; 40 MPH)</td>
<td></td>
</tr>
<tr>
<td>Half Road Closure on the Far Side of an Intersection</td>
<td>Not applicable in Delaware</td>
<td>Not applicable in Delaware</td>
<td></td>
</tr>
<tr>
<td>Multiple Lane Closures at an Intersection</td>
<td>TA-23 (≤ 40 MPH) or</td>
<td>TA-23 (≤ 40 MPH) or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TA-33 (&gt; 40 MPH)</td>
<td>TA-33 (&gt; 40 MPH)</td>
<td></td>
</tr>
<tr>
<td>Closure in the Center of an Intersection</td>
<td>Not applicable in Delaware</td>
<td>Not applicable in Delaware</td>
<td></td>
</tr>
<tr>
<td>Closure at the Side or Center of an Intersection</td>
<td>TA-27</td>
<td>TA-27</td>
<td></td>
</tr>
<tr>
<td>Sidewalk Detour or Diversion</td>
<td>TA-28</td>
<td>TA-28</td>
<td></td>
</tr>
<tr>
<td>Crosswalk Closures and Pedestrian Detours</td>
<td>TA-29</td>
<td>TA-29</td>
<td></td>
</tr>
</tbody>
</table>
• Upstream lane closure(s) in advance of intersection
  – DE Guidance: *Use TA-33 for roads > 40 mph*
Far side intersection lane closures should follow TA-23 with merging taper farther upstream of intersection.
Pedestrian detours are generally preferred over in-street diversions on state-maintained roads.

**GOOD**

**BAD**
DE Standard:

- Approved detour plan for pedestrian detours along state-maintained roads

- Temporary midblock crosswalks require DelDOT Traffic approval

- If approved, temporary midblock crosswalks signed and marked in accordance with Parts 2 and 3
TA-29 requires a DelDOT Traffic approved pedestrian detour plan
Work within the traveled way of a multi-lane highway

Relatively uncommon applications requiring project-specific plans

<table>
<thead>
<tr>
<th>Typical Application Description</th>
<th>Two-Lane Conventional Road</th>
<th>Multi-Lane Conventional Road</th>
<th>Interstate, Freeway, or Expressway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior Lane Closure on a Multi-Lane Street</td>
<td>-</td>
<td>TA-30 (&lt; 40 MPH) or TA-33 (&gt; 40 MPH)</td>
<td>-</td>
</tr>
<tr>
<td>Lane Closure on a Street with Uneven Directional Volumes</td>
<td>-</td>
<td>TA-31 (&lt; 40 MPH) or TA-33 (&gt; 40 MPH)</td>
<td>-</td>
</tr>
<tr>
<td>Half Road Closure on a Multi-Lane, High-Speed Highway</td>
<td>-</td>
<td>TA-32</td>
<td>-</td>
</tr>
<tr>
<td>Stationary Lane Closure on a Divided Highway</td>
<td>-</td>
<td>TA-33</td>
<td>TA-33</td>
</tr>
<tr>
<td>Lane Closure with a Temporary Traffic Barrier</td>
<td>-</td>
<td>TA-34</td>
<td>TA-34</td>
</tr>
<tr>
<td>Short Duration and Mobile Operations on a Multi-Lane Road</td>
<td>-</td>
<td>TA-35 or TA-35A</td>
<td>TA-35 or TA-35A</td>
</tr>
<tr>
<td>Mobile Striping Operations on a Multi-Lane Road</td>
<td>TA-35B or TA-35C</td>
<td>TA-35D, TA-35E, TA-35F, or TA-35G</td>
<td>-</td>
</tr>
</tbody>
</table>
Case 7 = TA-33

- Removed upstream Merge signs
- **TTC devices on side road when intersection is within TTC zone**

- **DE Guidance:** *Omit signs on left-hand side along undivided highways and divided highways with narrow medians*

- **DE Standard:** **TMA** required for long-term, intermediate, and short-term operations on roads > 40 mph
DE Guidance: *For all multi-lane roads, sign spacing follows I/F/E criteria in Table 6H-3*
SHOULDER CLOSED AHEAD
“permanent” warning signs conflict with TA-33 (single lane closure)
Incorrect warning sign for downstream lane closure application

BR 1-325 on Otts Chapel Rd over Persimmon Run
• Example of one method for long-term lane closure

• **Use of barrier based on engineering judgment**

• Optional longitudinal buffer space based on Table 6C-2

• **Barrier shall not be placed on merging taper; closed in advance with drums**

---

**Table 6C-2. Stopping Sight Distance as a Function of Speed**

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Distance (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>115</td>
</tr>
<tr>
<td>25</td>
<td>155</td>
</tr>
<tr>
<td>30</td>
<td>200</td>
</tr>
<tr>
<td>35</td>
<td>250</td>
</tr>
<tr>
<td>40</td>
<td>305</td>
</tr>
<tr>
<td>45</td>
<td>360</td>
</tr>
<tr>
<td>50</td>
<td>425</td>
</tr>
<tr>
<td>55</td>
<td>495</td>
</tr>
<tr>
<td>60</td>
<td>570</td>
</tr>
<tr>
<td>65</td>
<td>645</td>
</tr>
<tr>
<td>70</td>
<td>730</td>
</tr>
<tr>
<td>75</td>
<td>820</td>
</tr>
</tbody>
</table>

*Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed.*
• Case 21 = TA-35
• Fewer shadow vehicles
• Corrected arrow boards
• Case 22 = TA-35A

• Fewer shadow vehicles

• Corrected arrow boards
• Case 23-B = TA-35B & TA-35C (multi-lane, conventional roads)
• Case 23-C = TA-35D – TA-35G (interstates, freeways, & expressways)
• DE Option: 2 separate convoys – application and cone recovery
  – TA-35 or TA-35A required for cone recovery convoy
Work within traveled way of an interstate, freeway, or expressway

<table>
<thead>
<tr>
<th>Typical Application Description</th>
<th>Two-Lane Conventional Road</th>
<th>Multi-Lane Conventional Road</th>
<th>Interstate, Freeway, or Expressway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Within the Traveled Way of an Interstate, Freeway, or Expressway</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lane Shift on a Multi-Lane, Divided Highway</td>
<td>-</td>
<td>TA-36</td>
<td>TA-36</td>
</tr>
<tr>
<td>Double Lane Closure on a Multi-Lane, Divided Highway</td>
<td>-</td>
<td>TA-37</td>
<td>TA-37</td>
</tr>
<tr>
<td>Interior Lane Closure on a Multi-Lane, Divided Highway</td>
<td>-</td>
<td>TA-37 or TA-38</td>
<td>TA-37 or TA-38</td>
</tr>
<tr>
<td>Median Crossover on a Multi-Lane, Divided Highway</td>
<td>-</td>
<td>TA-39</td>
<td>TA-39</td>
</tr>
<tr>
<td>Median Crossover for an Entrance Ramp</td>
<td>-</td>
<td>TA-40</td>
<td>TA-40</td>
</tr>
<tr>
<td>Median Crossover for an Exit Ramp</td>
<td>-</td>
<td>TA-41</td>
<td>TA-41</td>
</tr>
<tr>
<td>Work in the Vicinity of an Exit Ramp</td>
<td>-</td>
<td>TA-42</td>
<td>TA-42</td>
</tr>
<tr>
<td>Partial Exit Ramp Closure</td>
<td>-</td>
<td>TA-43</td>
<td>TA-43</td>
</tr>
<tr>
<td>Work in the Vicinity of an Entrance Ramp</td>
<td>-</td>
<td>TA-44</td>
<td>TA-44</td>
</tr>
<tr>
<td>Temporary Reversible Lane Using Movable Barriers</td>
<td>-</td>
<td>Not applicable in Delaware</td>
<td>Not applicable in Delaware</td>
</tr>
</tbody>
</table>
• W1-4 sign depicts number of travel lanes
• 10-ft (MIN.) shoulder lane
• Use W24-1 if tangent < 600 ft
• DE Guidance:
  – Shift taper = L
  – Illuminate shift area

Interstate Bridge Maintenance, I-495
• Case 9 = TA-37

• Separate arrow board for each closed lane

• DE Guidance: For all multi-lane roads, sign spacing follows I/F/E criteria in Table 6H-3

• New standard sign

OLD

RIGHT TWO LANES CLOSED 1/2 MILE

NEW

2 RIGHT LANES CLOSED 1/2 MILE

W20-5a
Case 9 = TA-37

Removed upstream Merge signs
• Case 8 = TA-38

• DE Guidance: *TA is strongly discouraged*
  
  – Worker safety concerns
  
  – Driver expectancy issues
  
  – Consider double lane closure (TA-37) prior to implementation
  
  – Approval based primarily on detailed work zone impact analysis
• Case 12 = TA-39

• Generally require full design plans (per AASHTO) for specific locations
Figure 6H-40. Median Crossover for an Entrance Ramp on a Multi-Lane, Divided Highway (TA-40)  
(Delaware Revision)

Temporary white edge line

Temporary yellow edge line

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 40

Figure 6H-41. Median Crossover for an Exit Ramp on a Multi-Lane, Divided Highway (TA-41)  
(Delaware Revision)

Lighting (optional)

Temporary yellow edge line

25-foot spacing

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 41
• Case 14 = TA-42
• Lane closure(s) (TA-33 or TA-37) upstream of exit ramp
• EXIT sign located in temporary gore
• Truck off-tracking should be considered
• DE Option: Close ramp if traffic conditions permit
• **Truck off-tracking should be considered**

• **DE Option:** Close ramp if traffic conditions permit
• Case 13 = TA-44

• Lane closure(s) (TA-33 or TA-37) upstream of exit ramp

• Two options
  – Lane addition
  – Merge condition

• DE Guidance: *AASHTO criteria used for acceleration lane (right figure)*

• *Truck off-tracking should be considered*

• DE Option: Close ramp if traffic conditions permit
TA-44. Work in the Vicinity of an Entrance Ramp on a Multi-Lane, Divided Highway

Impact Repairs Bridge No. 1-739-059

SR 141 on-ramp to northbound I-95

SR 141 on-ramp lane addition on I-95 northbound per TA-44

Double lane closure (TA-37) used upstream of SR 141 on-ramp
Work in the vicinity of a grade crossing

<table>
<thead>
<tr>
<th>Typical Application Description</th>
<th>Two-Lane Conventional Road</th>
<th>Multi-Lane Conventional Road</th>
<th>Interstate, Freeway, or Expressway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Within the Traveled Way of an Interstate, Freeway, or Expressway (see Section 6G.14) – also applicable to other roadway types, as noted</td>
<td>-</td>
<td>TA-36</td>
<td>TA-36</td>
</tr>
<tr>
<td>Lane Shift on a Multi-Lane, Divided Highway</td>
<td>-</td>
<td>TA-36</td>
<td>TA-36</td>
</tr>
<tr>
<td>Double Lane Closure on a Multi-Lane, Divided Highway</td>
<td>-</td>
<td>TA-37</td>
<td>TA-37</td>
</tr>
<tr>
<td>Interior Lane Closure on a Multi-Lane, Divided Highway</td>
<td>-</td>
<td>TA-37 or TA-38</td>
<td>TA-37 or TA-38</td>
</tr>
<tr>
<td>Median Crossover on a Multi-Lane, Divided Highway</td>
<td>-</td>
<td>TA-39</td>
<td>TA-39</td>
</tr>
<tr>
<td>Median Crossover for an Entrance Ramp</td>
<td>-</td>
<td>TA-40</td>
<td>TA-40</td>
</tr>
<tr>
<td>Median Crossover for an Exit Ramp</td>
<td>-</td>
<td>TA-41</td>
<td>TA-41</td>
</tr>
<tr>
<td>Work in the Vicinity of an Exit Ramp</td>
<td>-</td>
<td>TA-42</td>
<td>TA-42</td>
</tr>
<tr>
<td>Partial Exit Ramp Closure</td>
<td>-</td>
<td>TA-43</td>
<td>TA-43</td>
</tr>
<tr>
<td>Work in the Vicinity of an Entrance Ramp</td>
<td>-</td>
<td>TA-44</td>
<td>TA-44</td>
</tr>
<tr>
<td>Temporary Reversible Lane Using Moveable Barriers</td>
<td>Not applicable in Delaware</td>
<td>Not applicable in Delaware</td>
<td>Not applicable in Delaware</td>
</tr>
<tr>
<td>Work in the Vicinity of a Grade Crossing (see Section 6G.18)</td>
<td>TA-46</td>
<td>TA-33</td>
<td>-</td>
</tr>
<tr>
<td>Work in the Vicinity of a Grade Crossing</td>
<td>TA-46</td>
<td>TA-33</td>
<td>-</td>
</tr>
</tbody>
</table>
• Case 17-A = TA-46

• DE Guidance: *TA-33 on multi-lane roads* (former Case 17-B)

• DE Guidance: 50-ft “influence area” on both sides of grade crossing

• Begin TTC zone upstream of crossing to reduce potential for queuing problems

• Provide law enforcement or flagger at crossing when queues extend across crossing

• DE Standard: **TMA roll-ahead buffer space shall not extend across crossing**
Section 6I.01 General

Traffic incidents can be divided into three general classes of duration, each of which has unique traffic control characteristics and needs. These classes are:

A. Major—expected duration of more than 2 hours,
B. Intermediate—expected duration of 30 minutes to 2 hours, and
C. Minor—expected duration under 30 minutes.

- 3 general classes of incidents
  - Major: > 2 hrs
  - Intermediate: 30 min – 2 hrs
  - Minor: < 30 min

Optional black-on-fluorescent pink warning and guide signs
Section 61.02 Major Traffic Incidents

Support:
01 Major traffic incidents are typically traffic incidents involving hazardous materials, fatal traffic crashes involving numerous vehicles, and other natural or man-made disasters. These traffic incidents typically involve closing all or part of a roadway facility for a period exceeding 2 hours.

 Guidance:
02 If the traffic incident is anticipated to last more than 24 hours, applicable procedures and devices set forth in other Chapters of Part 6 should be used.
07 All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for all major traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert traffic approaching the queue and to encourage early diversion to an appropriate alternative route.
08 Attention should be paid to the upstream end of the traffic queue such that warning is given to road users approaching the back of the queue.

- Partial or full road closure > 2 hrs

- TTC complying with Chapters 6A – 6H for incidents lasting > 24 hrs

- TTC including diversions, tapered lane closures, and upstream warning devices

- Warning devices at back of queue

I-95 Newark Toll Plaza
Highway Speed E-ZPass Lanes
Support:

01 Intermediate traffic incidents typically affect travel lanes for a time period of 30 minutes to 2 hours, and usually require traffic control on the scene to divert road users past the blockage. Full roadway closures might be needed for short periods during traffic incident clearance to allow traffic incident responders to accomplish their tasks.

Guidance:

03 All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for intermediate traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert traffic approaching the queue and to encourage early diversion to an appropriate alternative route.

04 Attention should be paid to the upstream end of the traffic queue such that warning is given to road users approaching the back of the queue.

- Lane closures 30 min to 2 hrs
- Intermittent road closure to clear incident
- **TTC including diversions, tapered lane closures, and upstream warning devices**
- **Warning devices at back of queue**
Support:
01 Minor traffic incidents are typically disabled vehicles and minor crashes that result in lane closures of less than 30 minutes. On-scene responders are typically law enforcement and towing companies, and occasionally highway agency service patrol vehicles.

02 Diversion of traffic into other lanes is often not needed or is needed only briefly. It is not generally possible or practical to set up a lane closure with traffic control devices for a minor traffic incident. Traffic control is the responsibility of on-scene responders.

Guidance:
03 When a minor traffic incident blocks a travel lane, it should be removed from that lane to the shoulder as quickly as possible.

- Disabled vehicles and minor crashes
- Lane closures < 30 min
- Responders include law enforcement, tow companies, and highway patrol vehicles (e.g., DelDOT MAP)
- Generally impractical to install TTC devices

SR 1, SR 24 to north of US 9 (Third Lane)
Today’s presentation will be posted on DelDOT’s DE MUTCD website

http://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml
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mbuckley@wrallp.com
Future DE MUTCD Training

- April 12th – Part 3 (Markings)
- May 16th – Parts 4 & 7 (Traffic Signals & School Areas)
- June 15th – Parts 8 & 9 (Railroads & Bicycle Facilities)
- $T^2$ course registration

http://www.ce.udel.edu/dct/T2Courses.html