CHAPTER 6H. TYPICAL APPLICATIONS

Section 6H.01 Typical Applications

Support:
Whenever the acronym “TTC” is used in this Chapter, it refers to “temporary traffic control”.

Standard:
The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:
Chapter 6G contains discussions of typical TTC activities. Chapter 6H presents typical applications for a variety of situations commonly encountered. While not every situation is addressed, the information illustrated can generally be adapted to a broad range of conditions. In many instances, an appropriate TTC plan is achieved by combining features from various typical applications. For example, work at an intersection might present a near-side work zone for one street and a far-side work zone for the other street. These treatments are found in two different typical applications, while a third typical application shows how to handle pedestrian crosswalk closures. Procedures for establishing TTC zones vary with such conditions as road configuration, location of the work, work activity, duration of work, road user volumes, road vehicle mix (buses, trucks, cars, motorcycles, and bicycles), and road user speeds. Examples are presented in this Chapter showing how to apply principles and standards. Applying these guidelines to actual situations and adjusting to field conditions requires engineering judgment. In general, the procedures illustrated represent minimum solutions for the situations depicted.

Option:
Other devices may be added to supplement the devices and device spacing may be adjusted to provide additional reaction time or delineation. Fewer devices may be used based on field conditions.

Support:
Figures and tables found throughout Part 6 provide information for the development of TTC plans. Also, Table 6H-3 is used for the determination of sign spacing and other dimensions for various area and roadway types.

Table 6H-1 is an index of the 46 typical applications. Typical applications are shown on the right page with notes on the facing page to the left. The legend for the symbols used in the typical applications is provided in Table 6H-2. In many of the typical applications, sign spacings and other dimensions are indicated by letters using the criteria provided in Table 6H-3. The formulas for determining taper lengths are also provided in Table 6H-3.
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<thead>
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<th>Typical Application Description</th>
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<td>Work on Very Low Volume Rural Road</td>
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<td>Lane Closure on Two-Lane Road Using Flaggers</td>
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<td>Lane Closure on Low-Volume, Two-Lane Road</td>
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<td>Lane Closure on Two-Lane Road Using Traffic Control Signals</td>
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<td>Haul Road Crossing</td>
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<td>Work in Center of Low-Volume Road</td>
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<tr>
<td>Surveying Along Centerline of Low-Volume Road</td>
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<td>Mobile Operations on Two-Lane Road</td>
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<td><strong>Work Within the Traveled Way of Urban Streets</strong></td>
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<td>Detour for One Travel Direction</td>
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<td>Detour for Closed Street</td>
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<td><strong>Work Within the Traveled Way at an Intersection and Sidewalks</strong></td>
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<td>Sidewalk Closures and Bypass Sidewalks</td>
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<tr>
<td>Crosswalk Closures and Pedestrian Detours</td>
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### Table 6H-1. Index to Typical Applications
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<tr>
<th>Typical Application Description</th>
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<td>Work Within the Traveled Way of Multilane Undivided Highways</td>
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<td>Interior Lane Closure on Multilane Street</td>
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<td>Lane Closure on Street with Uneven Directional Volumes</td>
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<tr>
<td>Half Road Closure on Multilane, High-Speed Highway</td>
<td>TA-32</td>
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<td>Work Within the Traveled Way of Multilane Divided Highways</td>
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<td>Lane Closure on Divided Highway</td>
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<tr>
<td>Lane Closure with Temporary Traffic Barrier</td>
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<td>Mobile Operation on Multilane Road</td>
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<td>Work Within the Traveled Way of Expressways and Freeways</td>
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<td>Lane Shift on Freeway</td>
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<td>Double Lane Closure on Freeway</td>
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<td>Median Crossover on Freeway</td>
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<td>Median Crossover for Entrance Ramp</td>
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<td>Median Crossover for Exit Ramp</td>
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<td>Partial Exit Ramp Closure</td>
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<td>Work in Vicinity of Entrance Ramp</td>
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<td>Temporary Reversible Lane Using Movable Barriers</td>
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<td>Work in the Vicinity of Highway-Rail Grade Crossings</td>
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<td>Work in Vicinity of Highway-Rail Grade Crossing</td>
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### Table 6H-2. Meaning of Symbols on Typical Application Diagrams

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<thead>
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<td><img src="image" alt="Arrow Panel Support" /></td>
<td>Arrow panel support or trailer (shown facing down)</td>
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<tr>
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<td>Changeable message sign or support trailer</td>
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<tr>
<td><img src="image" alt="Channelizing Device" /></td>
<td>Channelizing device</td>
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<td><img src="image" alt="Crash Cushion" /></td>
<td>Crash Cushion</td>
</tr>
<tr>
<td><img src="image" alt="Direction of Temporary Traffic Detour" /></td>
<td>Direction of temporary traffic detour</td>
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<td><img src="image" alt="High Level Warning Device (Flag Tree)" /></td>
<td>High level warning device (Flag tree)</td>
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<td>Luminaire</td>
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<td><img src="image" alt="Pavement Markings to be Removed" /></td>
<td>Pavement markings that should be removed for a long term project</td>
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<td><img src="image" alt="Sign (Shown Facing Left)" /></td>
<td>Sign (shown facing left)</td>
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<td><img src="image" alt="Temporary Barrier" /></td>
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<tr>
<td><img src="image" alt="Temporary Barrier with Warning Lights" /></td>
<td>Temporary barrier with warning lights</td>
</tr>
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<td><img src="image" alt="Traffic or Pedestrian Signal" /></td>
<td>Traffic or Pedestrian signal</td>
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<td><img src="image" alt="Truck Mounted Attenuator" /></td>
<td>Truck mounted attenuator</td>
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<tr>
<td><img src="image" alt="Type III Barricade" /></td>
<td>Type III Barricade</td>
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<td><img src="image" alt="Warning Lights" /></td>
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<tr>
<td><img src="image" alt="Work Vehicle" /></td>
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Notes for Figure 6H-1—Typical Application 1

Work Beyond the Shoulder

Guidance:
1. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

Option:
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. The ROAD WORK AHEAD sign may be omitted where the work space is behind a barrier, more than 24 in behind the curb, or 15 ft or more from the edge of any roadway.
4. For short-term, short-duration or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights

Standard:
6. Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating, or strobe lights.
Figure 6H-1. Work Beyond the Shoulder (TA-1)

Note: See Table 6H-2 for the meaning of symbols.

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Notes for Figure 6H-2—Typical Application 2
Very Low Volume Rural Road Short-Duration Operation

Guidance:
1. The treatment shown should only be used in daytime conditions on very low volume (typically less than 100 ADT) self-regulating rural roads.
2. In situations where a single work vehicle/equipment is being used, adequate sight distance should be maintained.

Option:
3. Flaggers or shadow vehicles may be necessary in areas of limited sight distance.

Standard:
4. In areas where vehicle traffic cannot effectively self-regulate one or two flaggers shall be used as illustrated in Figure 6H-10.
5. Although vehicle hazard warning signals can be used to supplement the rotating lights or strobe lights, they shall not be used instead of rotating light or strobe lights.
**Figure 6H-2. Work on Very Low Volume Rural Road (TA-2)**

Note: See Table 6H-2 for the meaning of symbols.

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Typical Application 2
Notes for Figure 6H-3—Typical Application 3

Work on Shoulders

Guidance:
1. A SHOULDER WORK sign should be placed on the left side of the roadway for a divided or one-way street only if the left shoulder is affected.

Option:
2. The Workers symbol signs may be used instead of SHOULDER WORK signs.
3. The SHOULDER WORK AHEAD sign on an intersecting roadway may be omitted where drivers emerging from that roadway will encounter another advance warning sign prior to this activity area.
4. For short-duration operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:
6. Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating, or strobe lights.
7. When paved shoulders having a width of 8 ft or more are closed, at least one advance warning sign shall be used. In addition, channelizing devices shall be used to close the shoulder in advance to delineate the beginning of the work space and direct vehicular traffic to remain within the traveled way.
Figure 6H-3. Work on Shoulders (TA-3)

Note: See Table 6H-2 for the meaning of symbols.

<table>
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<th>Posted Speed (MPH)</th>
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Typical Application 3
Notes for Figure 6H-4—Typical Application 4
Short-Duration or Mobile Operation on Shoulder

Guidance:
1. In those situations where multiple work locations within a limited distance make it practical to place stationary signs, the distance between the advance warning sign and the work should not exceed a 2 mile maximum.
2. **DELETED**

Option:
3. The ROAD WORK NEXT XX MILES sign may be used instead of the ROAD WORK AHEAD sign if the work locations occur over a distance of more than 2 miles.
4. Warning signs may be omitted when the work vehicle displays high-intensity rotating, flashing, oscillating, or strobe lights if the distance between work locations is 1 mile or more, and if the work vehicle travels at vehicular traffic speeds between locations.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:
6. **Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating, or strobe lights.**
7. **If an arrow panel is used for an operation on the shoulder, the caution mode shall be used.**
Figure 6H-4. Short-Duration or Mobile Operation on Shoulder (TA-4)

Note: See Table 6H-2 for the meaning of symbols.

Truck-Mounted Attenuator (optional)

See Note 1

Typical Application 4
Notes for Figure 6H-5—Typical Application 5
Shoulder Closure on Freeway

Guidance:
1. SHOULDER CLOSED signs should be used on limited-access highways where there is no opportunity for disabled vehicles to pull off the roadway.
2. If drivers cannot see a pull-off area beyond the closed shoulder, information regarding the length of the shoulder closure should be provided in feet or miles, as appropriate.
3. The use of a temporary traffic barrier should be based on engineering judgment.

Standard:
4. Where temporary traffic barriers are installed, the ends of the barrier shall be treated in accordance with the provisions of Section 6F.81.

Option:
5. The barrier shown in this typical application is an example of one method that may be used to close a shoulder of a long-term project.
6. The warning lights or reflectors shown on the barrier may be used.
Figure 6H-5. Shoulder Closure on Freeway (TA-5)

Note: See Table 6H-2 for the meaning of symbols.
Notes for Figure 6H-6—Typical Application 6
Shoulder Work with Minor Encroachment

Guidance:
1. All lanes should be a minimum of 10 ft in width as measured to the near face of the channelizing devices.
2. The treatment shown should be used on a minor road having low speeds. For higher-speed traffic conditions, a lane closure should be used.

Option:
3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 ft may be used.
4. Where the opposite shoulder is suitable for carrying vehicular traffic and of adequate width, lanes may be shifted by use of closely spaced channelizing devices, provided that the minimum lane width of 10 ft is maintained.
5. Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
6. Temporary traffic barriers may be used along the work space.
7. The shadow vehicle may be omitted if a taper and channelizing devices are used.
8. A truck-mounted attenuator may be used on the shadow vehicle.
9. For short-duration work, the taper and channelizing devices may be omitted if a shadow vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
10. Vehicle hazard warning signals be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:
11. Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating, or strobe lights.
Figure 6H-6. Shoulder Work with Minor Encroachment (TA-6)

Note: See Table 6H-2 for the meaning of symbols.

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Typical Application 6
Notes for Figure 6H-7—Typical Application 7
Road Closure with Diversion

Support:
1. Signs and object markers are shown for one direction of travel only.

Standard:
2. Devices similar to those depicted shall be placed for the opposite direction of travel.
3. Pavement markings no longer applicable shall be removed or obliterated as soon as practicable.
4. Temporary barriers and end treatments shall be crashworthy.

Guidance:
5. If the tangent distance along the temporary diversion is short and the curvature is sharp, the Winding Road sign should be used at the location of the first Reverse Curve sign. The second Reverse Curve sign should be omitted.
6. When the tangent section of the diversion is more than 600 ft, and the diversion has sharp curves with recommended speeds of 30 mph or less, Reverse Turn signs should be used.
7. Where the temporary pavement and old pavement are different colors, the temporary pavement should start on the tangent of the existing pavement and end on the tangent of the existing pavement.

Option:
8. Flashing warning lights and/or flags may be used to call attention to the warning signs.
9. DELETED
10. Delineators or channelizing devices may be used along the diversion.
Note: See Table 6H-2 for the meaning of symbols.

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Note: Warning sign sequence in this direction same as below.
Notes for Figure 6H-8—Typical Application 8
Road Closure with Off-Site Detour

Guidance:
1. Regulatory traffic control devices should be modified as needed for the duration of the detour.
2. If the road is opened for some distance beyond the intersection and/or there are significant origin/destination points beyond the intersection, the ROAD CLOSED and DETOUR signs Type III Barricades should be located at the edge of the traveled way.

Option:
3. A Route Sign Directional assembly may be placed on the far left corner of the intersection to augment or replace the one shown on the near right corner.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. Cardinal direction plaques may be used with route signs.
Figure 6H-8. Road Closure with Off-Site Detour (TA-8)

Note: See Table 6H-2 for the meaning of symbols.
Notes for Figure 6H-9—Typical Application 9  
Overlapping Routes with Detour

Support:
1. TTC devices are shown for one direction of travel only.

Standard:
2. Devices similar to those depicted shall be placed for the opposite direction of travel.

Guidance:
3. STOP signs displayed to side roads should be installed as needed along the temporary route.

Option:
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. **DELETED**
6. Cardinal direction plaques **should** be used with route signs.
Figure 6H-9. Overlapping Routes with Detour (TA-9)

State Route 4

State Route 17

Type III Barricade

State Routes 4 and 17

Typical Application 9
Notes for Figure 6H-10—Typical Application 10
Lane Closure for One Lane-Two Way Traffic Control

Option:
1. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).
2. The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short-duration operations.
3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:
4. The buffer space should be extended so that the two-way traffic taper is placed before a horizontal (or crest vertical) curve to provide adequate sight distance for the flagger and a queue of stopped vehicles.

Standard:
5. At night, flagger stations shall be illuminated, except in emergencies.

Guidance:
6. When used, the BE PREPARED TO STOP sign should be located between the Flagger sign and the ONE LANE ROAD sign.
7. When a highway-rail grade crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the TTC zone should be extended so that the transition area precedes the highway-rail grade crossing.
8. When a highway-rail grade crossing equipped with active warning devices exists within the activity area, provisions should be made for keeping flaggers informed as to the activation status of these warning devices.
9. When a highway-rail grade crossing exists within the activity area, drivers operating on the left side of the normal centerline should be provided with comparable warning devices as for drivers operating on the right side of the normal centerline.
10. Early coordination with the railroad company should occur before work starts.

Option:
11. A flagger or a uniformed law enforcement officer may be used at the highway-rail grade crossing to minimize the probability that vehicles are stopped within 15 ft of the highway-rail grade crossing, measured from both sides of the outside rails.

Guidance:
12. Access should be controlled throughout the construction or maintenance work zone. Closure of all entering intersections within the zone should be considered. Driveways create a problem that should be monitored by flaggers. Flaggers should have good visual contact or two-way radio contact with each other.
13. Length of work area should be based on the ability of flaggers to communicate.
Figure 6H-10. Lane Closure for One Lane-Two Way Traffic Control (TA-10)

Note: See Table 6H-2 for the meaning of symbols.

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Note: The buffer space should be extended so that the two-way traffic taper is placed before a horizontal (or crest vertical) curve to provide adequate sight distance for the flagger and a queue of stopped vehicles.

Typical Application 10
Notes for Figure 6H-11—Typical Application 11
Lane Closure on Two-Lane Road with Low Traffic Volumes

Option:

1. This TTC zone application may be used as an alternate to the TTC application shown in Figure 6H-10 (using flaggers) when the following conditions exist:
   a. Vehicular traffic volume is such that sufficient gaps exist for vehicular traffic that must yield.
   b. Road users from both directions are able to see approaching vehicular traffic through and beyond the work site and have sufficient visibility of approaching vehicles.

2. The Type B flashing warning lights may be placed on the ROAD WORK AHEAD and the ONE LANE ROAD AHEAD signs whenever a night lane closure is necessary.
Figure 6H-11. Lane Closure on Two-Lane Road with Low Traffic Volumes

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

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Typical Application 11
Notes for Figure 6H-12—Typical Application 12
Lane Closure on Two-Lane Road Using Traffic Control Signals

Standard:
1. Temporary traffic control signals shall be installed and operated in accordance with the provisions of Part 4. Temporary traffic control signals shall meet the physical display and operational requirements of conventional traffic control signals.
2. Temporary traffic control signal timing shall be established by qualified officials. Durations of red clearance intervals shall be adequate to clear the one-lane section of conflicting vehicles.
3. When the temporary traffic control signal is changed to the flashing mode, either manually or automatically, red signal indications shall be flashed to both approaches.
4. Stop lines shall be installed with temporary traffic control signals for intermediate and long-term closures. Existing conflicting pavement markings and raised pavement marker reflectors between the activity area and the stop line shall be removed. After the temporary traffic control signal is removed, the stop lines and other temporary pavement markings shall be removed and the permanent pavement markings restored.
5. Safeguards shall be incorporated to avoid the possibility of conflicting signal indications at each end of the TTC zone.

Guidance:
6. Where no-passing lines are not already in place, they should be added.
7. Adjustments in the location of the advance warning signs should be made as needed to accommodate the horizontal or vertical alignment of the roadway, recognizing that the distances shown for sign spacings are minimums. Adjustments in the height of the signal heads should be made as needed to conform to the vertical alignment.

Option:
8. Flashing warning lights shown on the ROAD WORK AHEAD and the ONE LANE ROAD AHEAD signs may be used.
9. Removable pavement markings may be used.

Support:
10. Temporary traffic control signals are preferable to flaggers for long-term projects and other activities that would require flagging at night.
11. The maximum length of activity area for one-way operation under temporary traffic control signal control is determined by the capacity required to handle the peak demand.
Figure 6H-12. Lane Closure on Two-Lane Road Using Traffic Control Signals (TA-12)

Note: See Table 6H-2 for the meaning of symbols.

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Notes for Figure 6H-13—Typical Application 13
Temporary Road Closure

Support:
1. Conditions represented are a planned closure not exceeding 20 minutes during the daytime.

Standard:
2. A flagger or uniformed law enforcement officer shall be used for this application. The flagger, if used for this application, shall follow the procedures noted in Sections 6E.04 and 6E.05.

Guidance:
3. The uniformed law enforcement officer, if used for this application, should follow the procedures noted in Sections 6E.04 and 6E.05.

Option:
4. A law enforcement officer and/or a changeable message sign may be used.

Standard:
5. A BE PREPARED TO STOP sign shall be located before the Flagger symbol sign.
Figure 6H-13. Temporary Road Closure (TA-13)

Note: See Table 6H-2 for the meaning of symbols.

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Notes for Figure 6H-14—Typical Application 14
Haul Road Crossing

Guidance:
1. Floodlights should be used to illuminate haul road crossings where existing light is inadequate.
2. Where no-passing lines are not already in place, they should be added.

Standard:
3. The traffic control method selected shall be used in both directions.

Flagging Method
4. When a road used exclusively as a haul road is not in use, the haul road shall be closed with Type III barricades and the Flagger symbol signs covered, or removed.
5. The flagger shall follow the procedures noted in Sections 6E.04 and 6E.05.
6. At night, flagger stations shall be illuminated, except in emergencies.

Signalized Method
7. When a road used exclusively as a haul road is not in use, Type III barricades shall be in place. The signals shall either flash yellow on the main road or be covered, and the Signal Ahead and STOP HERE ON RED signs shall be covered or hidden from view.
8. The temporary traffic control signals shall control both the highway and the haul road and shall meet the physical display and operational requirements of conventional traffic control signals as described in Part 4. Traffic control signal timing shall be established by authorized officials.
9. Stop lines shall be used on existing highway with temporary traffic control signals.
10. Existing conflicting pavements markings between the stop lines shall be removed. After the temporary traffic control signal is removed, the stop lines and other temporary pavement markings shall be removed and the permanent pavement markings restored.
Figure 6H-14. Haul Road Crossing (TA-14)

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Note: See Table 6H-2 for the meaning of symbols.
Notes for Figure 6H-15—Typical Application 15
Work in Center of Road with Low Traffic Volumes

Guidance:
1. The lanes on either side of the center work space should have a minimum width of 10 ft as measured from the near edge of the channelizing devices to the edge of pavement or the outside edge of paved shoulder.
2. Workers in the roadway should wear high-visibility safety apparel as described in Section 6D.03.

Option:
3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
4. If the closure continues overnight, warning lights may be used on the channelizing devices.
5. A lane width of 9 ft may be used for short-term stationary work on low-volume, low-speed roadways when motor vehicle traffic does not include longer and wider heavy commercial vehicles.
6. A work vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights may be used instead of the channelizing devices forming the tapers or the high-level warning devices.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:
8. Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating, or strobe lights.
Figure 6H-15. Work in Center of Road with Low Traffic Volumes (TA-15)

Typical Application 15

Note: See Table 6H-2 for the meaning of symbols.

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10 ft minimum to edge of pavement or outside edge of paved shoulder
Notes for Figure 6H-16—Typical Application 16
Surveying Along Centerline of Road with Low Traffic Volumes

Guidance:
1. Cones should be placed 6 inches to 12 inches on either side of the centerline.
2. Spacing of channelizing devices should not exceed a distance in feet equal to the speed limit (mph) when used for the taper channelization and a distance in feet of 2 times the speed limit (mph) when used for tangent channelization.
3. A flagger should be used to warn workers who cannot watch road users.
4. Workers in the roadway should wear high-visibility safety apparel as described in Section 6D.03.

Standard:
5. For surveying on the centerline of a high-volume road, one lane shall be closed using the information illustrated in Figure 6H-10.

Option:
6. A high-level warning device may be used to protect a surveying device, such as a target on a tripod.
7. Cones may be omitted for a cross-section survey.
8. ROAD WORK AHEAD signs may be used in place of the SURVEY CREW AHEAD signs.
9. Flags may be used to call attention to the advance warning signs.
10. If the work is along the shoulder, the flagger may be omitted.
11. For a survey along the edge of the road or along the shoulder, cones may be placed along the edge line.
12. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:
13. When used, the BE PREPARED TO STOP sign should be located before the Flagger symbol sign.
Figure 6H-16. Surveying Along Centerline of Road with Low Traffic Volumes (TA-16)

Note: See Table 6H-2 for the meaning of symbols.

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Typical Application 16
Notes for Figure 6H-17—Typical Application 17
Mobile Operations on Two-Lane Road

Standard:
1. Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.
2. Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.
3. If an arrow panel is used, it shall be used in the caution mode.
3a. When the X VEHICLE CONVOY (CW21-10b) sign is used, it shall have the number of convoy vehicles displayed in the number designation “X” location.

Guidance:
4. Where practical and when needed, the work and shadow vehicles should pull over periodically to allow vehicular traffic to pass.
5. Whenever adequate stopping sight distance exists to the rear, the shadow vehicle should maintain the minimum distance from the work vehicle and proceed at the same speed. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.
6. The shadow vehicles also be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.

Option:
7. The distance between the work and shadow vehicles may vary according to terrain, work activity, and other factors.
8. Additional shadow vehicles to warn and reduce the speed of oncoming or opposing vehicular traffic may be used. Law enforcement vehicles may be used for this purpose.
9. A truck-mounted attenuator may be used on the shadow vehicle or on the work vehicle.
10. If the work and shadow vehicles cannot pull over to allow vehicular traffic to pass frequently, a DO NOT PASS sign may be placed on the rear of the vehicle blocking the lane.

Support:
11. Shadow vehicles are used to warn motor vehicle traffic of the operation ahead.

Standard:
12. Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating, or strobe lights.
Figure 6H-17. Mobile Operations on Two-Lane Road (TA-17)

Note: See Table 6H-2 for the meaning of symbols.

Distance to Work Vehicle may vary 60-100 ft

Typical Application 17
Notes for Figure 6H-18—Typical Application 18
Lane Closure on Minor Street

Standard:
1. This TTC shall be used only for low-speed facilities having low traffic volumes.

Option:
2. Where the work space is short, where road users can see the roadway beyond, and where volume is low, vehicular traffic may be self-regulating.

Standard:
3. Where vehicular traffic cannot effectively self-regulate, one or two flaggers shall be used as illustrated in Figure 6H-10.

Option:
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. A truck-mounted attenuator may be used on the work vehicle and the shadow vehicle.
Typical Application 18

Note: Warning sign sequence in this direction same as below.

Truck-Mounted Attenuator (optional)
Buffer Space (optional)

100 ft MAX.

Work Vehicle (optional)

Note: See Table 6H-2 for the meaning of symbols.

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Figure 6H-18. Lane Closure on Minor Street (TA-18)
Notes for Figure 6H-19—Typical Application 19  
Detour for One Travel Direction

Guidance:
1. This plan should be used for streets without posted route numbers.
2. On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.

Option:
3. The STREET CLOSED legend may be used in place of ROAD CLOSED.
4. Additional DO NOT ENTER signs may be used at intersections with intervening streets.
5. DELETED
6. Detour signs may be located on the far side of intersections.
7. A Street Name sign may be mounted with the Detour sign. The Street Name sign may be either white on green or black on orange.

Standard:
8. When used, the Street Name sign shall be placed above the Detour sign.
Figure 6H-19. Detour for One Travel Direction (TA-19)

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Note: See Table 6H-2 for the meaning of symbols.

Typical Application 19
Notes for Figure 6H-20—Typical Application 20
Detour for Closed Street

Guidance:
1. This plan should be used for streets without posted highway system route numbers.
2. On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.

Option:
3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
4. DELETED
5. Detour signs may be located on the far side of intersections. A Detour sign with an advance arrow may be used in advance of a turn.
6. A Street Name sign may be mounted with the Detour sign. The Street Name sign may be either white on green or black on orange.

Standard:
7. When used, the Street Name sign shall be placed above the Detour sign.

Support:
8. See Figure 6H-9 for the information for detouring a numbered highway.
**Figure 6H-20. Detour for Closed Street (TA-20)**

Note: See Table 6H-2 for the meaning of symbols.

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Typical Application 20
Notes for Figure 6H-21—Typical Application 21
Lane Closure on Near Side of Intersection

Standard:
1. The merging taper shall direct vehicular traffic into either the right or left lane, but not both.

Guidance:
2. In this typical application, a left taper should be used so that right-turn movements will not impede through motor vehicle traffic. However, the reverse should be true for left-turn movements.
3. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

Option:
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. A shadow vehicle with a truck-mounted attenuator may be used.
6. A work vehicle with high-intensity rotating, flashing, oscillating, or strobe lights may be used with the high-level warning device.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:
8. Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating, or strobe lights.
Figure 6H-21. Lane Closure on Near Side of Intersection (TA-21)

Note: See Table 6H-2 for the meaning of symbols.

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Notes for Figure 6H-22—Typical Application 22
Right Lane Closure on Far Side of Intersection

Guidance:
1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

Option:
2. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a right lane having significant right turning movements, then the right lane may be restricted to right turns only, as shown. This procedure increases the through capacity by eliminating right turns from the open through lane.
3. For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through vehicular traffic.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. Where the turning radius is large, it may be possible to create a right-turn island using channelizing devices or pavement markings.
Figure 6H-22. Right Lane Closure on Far Side of Intersection (TA-22)

Note: See Table 6H-2 for the meaning of symbols.

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Typical Application 22
Notes for Figure 6H-23—Typical Application 23

Left Lane Closure on Far Side of Intersection

Guidance:
1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

Option:
2. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
3. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a left lane having significant left-turning movements, then the left lane may be reopened as a turn bay for left turns only, as shown.

3a. For Short-Term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a supplemental plaque.

Support:
4. By first closing off the left lane and then reopening it as a turn bay, an island is created with channelizing devices that allows the LEFT LANE MUST TURN LEFT sign to be repeated on the left adjacent to the lane that it controls.
Figure 6H-23. Left Lane Closure on Far Side of Intersection (TA-23)

Note: See Table 6H-2 for the meaning of symbols.

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Notes for Figure 6H-24—Typical Application 24
Half Road Closure on Far Side of Intersection

Guidance:
1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.
2. When turn prohibitions are implemented, two turn prohibition signs should be used, one on the near side and, space permitting, one on the far side of the intersection.

Option:
3. A buffer space may be used between opposing directions of vehicular traffic as shown in this application.
4. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, if there is a significant right-turning movement, then the right lane may be restricted to right turns only, as shown.
5. Where the turning radius is large, a right-turn island using channelizing devices or pavement markings may be used.
6. There may be insufficient space to place the back-to-back Keep Right sign and No Left Turn symbol signs at the end of the row of channelizing devices separating opposing vehicular traffic flows. In this situation, the No Left Turn symbol sign may be placed on the right and the Keep Right sign may be omitted.
7. For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through vehicular traffic.
8. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
9. Temporary pavement markings may be used to delineate the travel path through the intersection.
9a. For Short-Term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a supplemental plaque.

Support:
10. Keeping the right lane open increases the through capacity by eliminating right turns from the open through lane.
11. A temporary turn island reinforces the nature of the temporary exclusive right-turn lane and enables a second RIGHT LANE MUST TURN RIGHT sign to be placed in the island.
**Figure 6H-24. Half Road Closure on Far Side of Intersection (TA-24)**

- **Road Work Ahead**
- **Left Lane Closed**
- **XXX FT** (optional)
- **Buffer Space** (optional)
- **Optional Pavement Markings**
- **End Road Work**

Note: See Table 6H-2 for the meaning of symbols.

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Typical Application 24
Notes for Figure 6H-25—Typical Application 25
Multiple Lane Closures at Intersection

Guidance:
1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and
devices shown in Figure 6H-29.
2. If the left through lane is closed on the near-side approach, the LEFT LANE MUST TURN LEFT sign
should be placed in the median to discourage through vehicular traffic from entering the left-turn bay.

Option:
3. The normal procedure is to close on the near side of the intersection any lane that is not carried through
the intersection. If the left-turning movement that normally uses the closed turn bay is small and/or the
gaps in opposing vehicular traffic are frequent, left turns may be permitted on that approach.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
Figure 6H-25. Multiple Lane Closures at Intersection (TA-25)

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Note: See Table 6H-2 for the meaning of symbols.
Notes for Figure 6H-26—Typical Application 26
Closure in Center of Intersection

Guidance:
1. All lanes should be a minimum of 10 ft in width as measured to the near face of the channelizing devices.

Option:
2. A high-level warning device may be placed in the work space, if there is sufficient room.
3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 ft may be used.
4. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
5. Unless the streets are wide, it may be physically impossible to turn left, especially for large vehicles. Left turns may be prohibited as required by geometric conditions.
6. For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:
8. Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating, or strobe lights.
Figure 6H-26. Closure in Center of Intersection (TA-26)

Note: See Table 6H-2 for the meaning of symbols.

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Typical Application 26
Notes for Figure 6H-27—Typical Application 27

Closure at Side of Intersection

Guidance:
1. The situation depicted can be simplified by closing one or more of the intersection approaches. If this cannot be done, and/or when capacity is a problem, through vehicular traffic should be directed to other roads or streets.
2. Depending on road user conditions, flagger(s) or uniformed law enforcement officer(s) should be used to direct road users within the intersection.

Standard:
3. At night, flagger stations shall be illuminated, except in emergencies.

Option:
4. ONE LANE ROAD AHEAD signs may also be used to provide adequate advance warning.
5. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
6. For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.
7. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:
8. When used, the BE PREPARED TO STOP sign should be located before the Flagger symbol sign.

Support:
9. Turns can be prohibited as required by vehicular traffic conditions. Unless the streets are wide, it might be physically impossible to make certain turns, especially for large vehicles.

Option:
10. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:
11. Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating, or strobe lights.
Figure 6H-27. Closure at Side of Intersection (TA-27)

Note: See Table 6H-2 for the meaning of symbols.

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See Note 2 for flagger information.

Typical Application 27
Notes for Figure 6H-28—Typical Application 28
Sidewalk Closures and Bypass Sidewalks

Standard:
1. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Guidance:
2. Where high speeds are anticipated, a temporary traffic barrier and, if necessary, a crash cushion should be used to separate the temporary sidewalks from vehicular traffic.
3. Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.

Option:
4. Street lighting may be considered.
5. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS signs, may be used to control vehicular traffic.
6. DELETED
7. Type C Steady-Burn or Type D 360-degree Steady-Burn warning lights may be used on channelizing devices separating the temporary sidewalks from vehicular traffic flow.
8. Signs, such as KEEP RIGHT (LEFT), may be placed along a temporary sidewalk to guide or direct pedestrians.
Figure 6H-28. Sidewalk Detour or Diversion (TA-28)

Note: See Table 6H-2 for the meaning of symbols.

Typical Application 28
Notes for Figure 6H-29—Typical Application 29
Crosswalk Closures and Pedestrian Detours

Standard:
1. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.
2. Curb parking shall be prohibited for at least 50 ft in advance of the midblock crosswalk.

Guidance:
3. Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.
4. Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.

Option:
5. Street lighting may be considered.
6. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS signs, may be used to control vehicular traffic.
7. **DELETE**
8. Type C Steady-Burn warning lights may be used on channelizing devices separating the work space from vehicular traffic.
9. In order to maintain the systematic use of the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs in a jurisdiction, the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs may be used in TTC zones.
Figure 6H-29. Crosswalk Closures and Pedestrian Detours (TA-29)

Note: For long-term stationary work, the double yellow centerline and/or lane lines should be removed between the crosswalk lines.

Note: See Table 6H-2 for the meaning of symbols.

Note: For long-term stationary work, the double yellow centerline and/or lane lines should be removed between the crosswalk lines.
Notes for Figure 6H-30—Typical Application 30
Interior Lane Closure on Multi-lane Street

Guidance:
1. This information applies to low-speed, low-volume urban streets. Where speed or volume is higher, additional signing such as LEFT LANE CLOSED with a supplemental distance plaque should be used between the signs shown.

Option:
2. The closure of the adjacent interior lane in the opposing direction may not be necessary, depending upon the activity being performed and the work space needed for the operation.
3. Shadow vehicles with a truck-mounted attenuator may be used.

Guidance:
4. When a highway-rail grade crossing exists within or upstream of the transition area and it is anticipated that backups resulting from the lane closure might extend through the highway-rail grade crossing, the TTC zone should be extended so that the transition area precedes the highway-rail grade crossing.
5. Early coordination with the railroad company should occur before work starts.
Figure 6H-30. Interior Lane Closure on Multi-lane Street (TA-30)

Note: See Table 6H-2 for the meaning of symbols.

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Notes for Figure 6H-31—Typical Application 31
Lane Closure on Street with Uneven Directional Volumes

Standard:
1. The illustrated information shall be used only when the vehicular traffic volume indicates that two lanes of vehicular traffic shall be maintained in the direction of travel for which one lane is closed.

Option:
2. The procedure may be used during a peak period of vehicular traffic and then changed to provide two lanes in the other direction for the other peak.

Guidance:
3. For high speeds, a LEFT/RIGHT LANE CLOSED with a supplemental distance plaque sign should be added for vehicular traffic approaching the lane closure, as shown in Figure 6H-32.
4. Conflicting pavement markings should be removed for long-term projects. For short-term and intermediate-term projects where this is not practical, the channelizing devices in the area where the pavement markings conflict should be placed at a maximum spacing of 0.5 S ft where S is the speed in mph. Temporary markings should be installed where needed.
5. If the lane shift has curves with recommended speeds of 30 mph or less, Reverse Turn signs should be used.
6. Where the shifted section is long, a Reverse Curve sign should be used to show the initial shift and a second sign should be used to show the return to the normal alignment.
7. If the tangent distance along the temporary diversion is less than 600 ft, the Double Reverse Curve sign should be used at the location of the first Reverse Curve sign. The second Reverse Curve sign should be omitted.

Option:
8. A longitudinal buffer space may be used in the activity area to separate opposing vehicular traffic.
9. An ALL LANES THRU supplemental plaque may be used to emphasize the point that all lanes shift and no lanes are closed.
10. A work vehicle or a shadow vehicle may be equipped with a truck-mounted attenuator.
Figure 6H-31. Lane Closures on Street with Uneven Directional Volumes (TA-31)

Note: See Table 6H-2 for the meaning of symbols.

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Typical Application 31
Notes for Figure 6H-32—Typical Application 32

Half Road Closure on Multi-lane, High-Speed Highway

Standard:
1. Pavement markings no longer applicable shall be removed or obliterated as soon as practical. Except for intermediate-term and short-term situations, temporary markings shall be provided to clearly delineate the temporary travel path. For short-term and intermediate-term situations where it is not feasible to remove and restore pavement markings, channelization shall be made dominant by using a very close device spacing.

Guidance:
2. When paved shoulders having a width of 8 ft or more are closed, channelizing devices should be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the traveled way.
3. Where channelizing devices are used instead of pavement markings, the maximum spacing should be 0.5 S feet where S is the speed in mph.
4. If the tangent distance along the temporary diversion is more than 600 ft, a Reverse Curve sign, left first, should be used instead of the Double Reverse Curve sign, and a second Reverse Curve sign, right first, should be placed in advance of the second reverse curve back to the original alignment.

Option:
4a. For Short-Term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a supplemental plaque.
5. Warning lights may be used to supplement channelizing devices at night.

Guidance:
6. When a highway-rail grade crossing exists within or upstream of the merging taper and it is anticipated that backups resulting from the lane closure might extend through the highway-rail grade crossing, the TTC zone should be extended so that the merging taper precedes the highway-rail grade crossing.
7. When a highway-rail grade crossing exists within the activity area, provisions should be made to provide road users operating on the left side of the normal centerline with comparable warning devices as supplied for road users operating on the right side of the normal centerline.
8. When a highway-rail grade crossing exists within the activity area, early coordination with the railroad company should occur before work starts.

Option:
9. When a highway-rail grade crossing exists within the activity area, a flagger may be used at the highway-rail grade crossing to minimize the probability that vehicles are stopped within 15 ft of the highway-rail grade crossing, measured from both sides of the outside rails.
10. A truck-mounted attenuator may be used on the work vehicle and/or the shadow vehicle.
**Figure 6H-32. Half Road Closure on Multi-lane, High-Speed Highway (TA-32)**

Typical Application 32

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Note: See Table 6H-2 for the meaning of symbols.
Notes for Figure 6H-33—Typical Application 33
Stationary Lane Closure on Divided Highway

**Standard:**
1. This information also shall be used when work is being performed in the lane adjacent to the median on a divided highway. In this case, the LEFT LANE CLOSED signs shall be substituted.
2. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed as needed.

**Guidance:**
3. When paved shoulders having a width of 8 ft or more are closed, channelizing devices should be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the traveled way.

**Option:**
3a. For Short-Term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a supplemental plaque.
4. A truck-mounted attenuator may be used on the work vehicle and/or shadow vehicle.

**Support:**
5. Where conditions permit, restricting all vehicles, equipment, workers, and their activities to one side of the roadway might be advantageous.
Figure 6H-33. Stationary Lane Closure on Divided Highway (TA-33)

Typical Application 33

Note: See Table 6H-2 for the meaning of symbols.
Notes for Figure 6H-34—Typical Application 34
Lane Closure with Temporary Traffic Barrier

Standard:
1. This information also shall be used when work is being performed in the lane adjacent to the median on a divided highway. In this case, the LEFT LANE CLOSED signs shall be substituted.

Guidance:
2. For long-term lane closures on facilities with permanent edge lines, a temporary edge line should be installed from the start of the merging taper to the far end of the downstream taper, and conflicting pavement markings should be removed.
3. The use of a barrier should be based on engineering judgment.

Standard:
4. Where temporary traffic barriers are installed, the ends of the barrier shall be treated in accordance with the provisions of Section 6F.81
5. The barrier shall not be placed along the merging taper. The lane shall first be closed using channelizing devices and pavement markings.

Option:
6. The barrier shown in this typical application is an example of one method that may be used to close a lane for a long-term project. If the work activity permits, a movable barrier may be used and relocated to the shoulder during nonwork periods or peak-period vehicular traffic conditions, as appropriate.
7. Type C Steady-Burn warning lights may be placed on channelizing devices and the barrier parallel to the edge of pavement for nighttime lane closures.

Standard:
8. If a movable barrier is used, the temporary white edge line shown in the typical application shall not be used. During the period when the right lane is opened, the sign legends and the channelization shall be changed to indicate that only the shoulder is closed, as illustrated in Figure 6H-5. The arrow panel, if used, shall be placed at the end of the shoulder taper and shall display the caution mode.

Guidance:
9. If a movable barrier is used, the shift should be performed in the following manner. When closing the lane, the lane should be initially closed with channelizing devices placed along a merging taper using the same information employed for a stationary lane closure. The lane closure should then be extended with the movable-barrier transfer vehicle moving with vehicular traffic. When opening the lane, the movable-barrier transfer vehicle should travel against vehicular traffic from the termination area to the transition area. The merging taper should then be removed using the same information employed for a stationary lane closure.
**Figure 6H-34. Lane Closure with Temporary Traffic Barrier (TA-34)**

- **ROAD WORK AHEAD** (optional)
- **END ROAD WORK** (optional)
- **Median**
- **Standard white edge line**
- **1/3L Shoulder taper (optional)**
- **Buffer space (optional)**
- **Crash cushion (see Section 6F.82)**

Note: See Table 6H-2 for the meaning of symbols.

**Typical Application 34**
Notes for Figure 6H-35—Typical Application 35

Mobile Operation on Multi-lane Road

Standard:

Arrow panels shall, as a minimum, be Type B, with a size of 60 x 30 inches.

1a. When the X VEHICLE CONVOY (CW21-10b) sign is used, it shall have the number of convoy vehicles displayed in the number designation “X” location. This number does not include advance warning shadow vehicles located on the shoulder in advance of the X VEHICLE CONVOY sign.

Guidance:

2. Vehicles used for these operations should be made highly visible with appropriate equipment, such as: high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow panels.
3. Shadow Vehicle 1 should be equipped with an arrow panel and truck-mounted attenuator.
4. Shadow Vehicle 2 should be equipped with an arrow panel. An appropriate lane closure sign should be placed on Shadow Vehicle 2 so as not to obscure the arrow panel.
5. Shadow Vehicle 2 should travel at a varying distance from the work operation so as to provide adequate sight distance for vehicular traffic approaching from the rear.
6. The spacing between the work vehicles and the shadow vehicles, and between each shadow vehicle should be minimized to deter road users from driving in between.
7. Work should normally be accomplished during off-peak hours.
8. When the work vehicle occupies an interior lane (a lane other than the far right or far left) of a directional roadway having a right shoulder 10 ft or more in width, Shadow Vehicle 2 should drive the right shoulder with a sign indicating that work is taking place in the interior lane.
8a. For divided highways with tow or three lanes in the direction of the mobile operation, the appropriate LEFT LANE CLOSED (CW20-5L), RIGHT LANE CLOSED (CW20-5R) or CENTER LANE CLOSED (CW20-5C) should be placed on Shadow Vehicle 2. For divided highways with four or more lanes in the direction of the mobile operation, the LANE BLOCKED (CW20-6) sign with an “X” under the appropriate closed lane number should be placed on Shadow Vehicle 2.

Option:

9. A truck-mounted attenuator may be used on Shadow Vehicle 2.
10. On high-speed roadways, a third shadow vehicle (not shown) may be used with Shadow Vehicle 1 in the closed lane, Shadow Vehicle 2 straddling the edge line, and Shadow Vehicle 3 on the shoulder.
11. Where adequate shoulder width is not available, Shadow Vehicle 3 may drive partially in the lane.
11a. A Portable Changeable Message sign with a minimum character height of 12 inches may be mounted on Shadow Vehicle 2 and substituted for the LEFT, RIGHT, or CENTER LANE CLOSED signs, displaying the same message as the sign it is replacing. An appropriate flashing arrow display may be alternated with this message.
Figure 6H-35. Mobile Operation on Multi-lane Road (TA-35)

Note: See Table 6H-2 for the meaning of symbols.

Typical Application 35
Notes for Figure 6H-36—Typical Application 36
Lane Shift on Freeway

Guidance:
1. The lane shift should be used when the work space extends into either the right or left lane of a divided highway and it is not practical, for capacity reasons, to reduce the number of available lanes.
2. When a lane shift is accomplished by using (1) geometry that meets the operational speed at which the permanent highway was designed, (2) full normal cross-section (full lane width and full shoulders), and (3) complete pavement markings, then only the initial general work-zone warning sign is required.
3. When the conditions in Note 2 are not met, the information shown in the typical application should be employed and all the following notes apply.

Standard:
4. Where temporary traffic barriers are installed, the ends of the barrier shall be treated in accordance with the provisions of Section 6E.81.
5. A warning sign shall be used to show the changed alignment.

Guidance:
6. Where the shifted section is longer than 600 ft, one set of Reverse Curve signs should be used to show the initial shift and a second set should be used to show the return to the normal alignment. If the tangent distance along the temporary diversion is less than 600 ft, the Double Reverse Curve sign should be used instead of the first Reverse Curve sign. The second Reverse Curve sign should be omitted.
7. If a STAY IN LANE sign is used, then solid white lane lines should be used.

Standard:
8. The minimum width of the shoulder lane shall be 10 ft.
9. For long-term stationary work, existing conflicting pavement markings shall be removed and temporary markings shall be installed before traffic patterns are changed.

Option:
10. For short-term stationary work, lanes may be delineated by channelizing devices or removable pavement markings instead of temporary pavement markings
11. DELETED
12. If the shoulder cannot adequately accommodate trucks, trucks may be directed to use the travel lanes.
13. The barrier shown in this typical application is one method that may be used to close a lane for a long-term project.

Guidance:
14. The use of a barrier should be based on engineering judgment.

Option:
15. Type C Steady-Burn warning lights may be placed on channelizing devices and the barrier parallel to the edge of pavement for nighttime lane closures.
Figure 6H-36. Lane Shift on Freeway (TA-36)

Note: See Table 6H-2 for the meaning of symbols.

Crash cushion (see Section 6F.82)

Lighting (optional)

Standard yellow edge line

1/2 L

1/3 L

1,000 ft

1,600 ft

2,600 ft

750 ft

1,600 ft

2,600 ft

DO NOT CHANGE LANES (optional)

DO NOT CHANGE LANES (optional)

DO NOT CHANGE LANES (optional)

ROAD WORK AHEAD

Standard solid white lane lines

Standard white edge line

1/2 L

750 ft

Typical Application 36
Notes for Figure 6H-37—Typical Application 37
Double Lane Closure on Freeway

Guidance:
1. Ordinarily, the preferred position for the second arrow panel is in the closed exterior lane at the beginning of the second merging taper. However, the second arrow panel should be placed in the closed interior lane at the end of the second merging taper in the following situations:
   a. When a shadow vehicle is used in the interior closed lane, and the second arrow panel is mounted on the shadow vehicle;
   b. If alignment or other conditions create any confusion as to which lane is closed by the second arrow panel; and
   c. When the first arrow panel is placed in the closed exterior lane at the end of the first merging taper (the alternative position when the shoulder is narrow).

Option:
2. Flashing warning lights and/or flags may be used to call attention to the initial warning signs.
3. A truck-mounted attenuator may be used on the shadow vehicle.
4. If a paved shoulder having a minimum width of 10 ft and sufficient strength is available, the left and adjacent interior lanes may be closed and vehicular traffic carried around the work space on the right lane and a right shoulder.
5. When a shoulder lane is used that cannot adequately accommodate trucks, trucks may be directed to use the normal travel lanes.
6. For Short-Term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a supplemental plaque.
**Figure 6H-37. Double Lane Closure on Freeway (TA-37)**

- **Shoulder taper**
- **Truck-Mounted Attenuator (optional)**
- **Buffer Space (optional)**
- **L**
- **2L**
- **XXX FT**
- **END ROAD WORK**

Note: See Table 6H-2 for the meaning of symbols.

**Typical Application 37**
Notes for Figure 6H-38—DELETED
Figure 6H-38. DELETED
Notes for Figure 6H-39—Typical Application 39
Median Crossover on Freeway

Standard:
1. **Channelizing devices or temporary traffic barriers shall be used to separate opposing vehicular traffic.**

Guidance:
2. For long-term work on high-speed, high-volume highways, consideration should be given to using a temporary traffic barrier to separate opposing vehicular traffic.

Option:
3. When a temporary traffic barrier is used to separate opposing vehicular traffic, the Two-Way Traffic, DO NOT PASS, KEEP RIGHT, and DO NOT ENTER signs may be eliminated.
4. The alignment of the crossover may be designed as a reverse curve.

Guidance:
5. When the crossover follows a curved alignment, the design criteria contained in the AASHTO “Policy on the Geometric Design of Highways and Streets” should be used (see Section 1A.11).
6. When channelizing devices have the potential of leading vehicular traffic out of the intended traffic space, the channelizing devices should be extended a distance in feet of 2 times the speed limit in mph beyond the end of the transition area as depicted.
7. Where channelizing devices are used, the Two-Way Traffic signs should be repeated every 1 mile.

Option:
8. **NEXT X MILES** Supplemental Distance plaques may be used with the Two-Way Traffic signs, where X is the distance to the end of the two-way section.

Support:
9. When the distance is sufficiently short that road users entering the section can see the far end of the section, they are less likely to forget that there is opposing vehicular traffic.
10. The sign legends for the four pairs of signs approaching the lane closure for the noncrossover direction of travel are not shown. They are similar to the series shown for the crossover direction, except that the left lane is closed.
Figure 6H-39. Median Crossover on Freeway (TA-39)

Shoulder taper

Temporary yellow edge line

Crash Cushion (optional)

DO NOT ENTER

DO NOT PASS

Standard Pavement Markings

Crash Cushion (optional)

End Road Work

Note: See Table 6H-2 for the meaning of symbols.

Typical Application 39
Notes for Figure 6H-40—Typical Application 40

Median Crossover for Entrance Ramp

Guidance:
1. The typical application illustrated should be used for carrying an entrance ramp across a closed directional roadway of a divided highway.
2. A temporary acceleration lane should be used to facilitate merging.
3. When used, the YIELD or STOP sign should be located far enough forward to provide adequate sight distance of oncoming mainline vehicular traffic to select a reasonably safe gap. If needed, YIELD or STOP lines should be installed across the ramp to indicate the point at which road users should YIELD or STOP. Also, a longer acceleration lane should be provided beyond the sign to reduce the gap size needed.

Option:
4. If vehicular traffic conditions allow, the ramp may be closed.
5. A broken edge line may be carried across the temporary entrance ramp to assist in defining the through vehicular traffic lane.
6. When a temporary traffic barrier is used to separate opposing vehicular traffic, the Two-Way Traffic signs and the DO NOT ENTER signs may be eliminated.
Figure 6H-40. Median Crossover for Entrance Ramp (TA-40)

Note: See Table 6H-2 for the meaning of symbols.

250 ft Channelizing devices at a spacing of 25 ft

Standard white edge line

25 ft spacing

Lighting (optional)

Typical Application 40
Guidance:
1. This typical application should be used for carrying an exit ramp across a closed directional roadway of a divided highway. The design criteria contained in the AASHTO “Policy on the Geometric Design of Highways and Streets” (see Section 1A.11) should be used for determining the curved alignment.
2. The guide signs should indicate that the ramp is open, and where the temporary ramp is located. Conversely, if the ramp is closed, guide signs should indicate that the ramp is closed.
3. When the exit is closed, a black on orange EXIT CLOSED panel should be placed diagonally across the interchange/intersection guide signs.
4. In the situation (not shown) where channelizing devices are placed along the mainline roadway, the devices’ spacing should be reduced in the vicinity of the off ramp to emphasize the opening at the ramp itself. Channelizing devices and/or temporary pavement markings should be placed on both sides of the temporary ramp where it crosses the median and the closed roadway.
5. Advance guide signs providing information related to the temporary exit should be relocated or duplicated adjacent to the temporary roadway.

Standard:
6. A temporary EXIT sign shall be located in the temporary gore. For better visibility, it shall be mounted a minimum of 7 ft from the pavement surface to the bottom of the sign.

Option:
7. Guide signs referring to the exit may need to be relocated to the median.
8. The temporary EXIT sign placed in the temporary gore may be either black on orange or white on green.
9. In some instances, a temporary deceleration lane may be useful in facilitating the exiting maneuver.
10. When a temporary traffic barrier is used to separate opposing vehicular traffic, the Two-Way Traffic signs may be omitted.
Figure 6H-41. Median Crossover for Exit Ramp (TA-41)

Note: See Table 6H-2 for the meaning of symbols.

Typical Application 41
Notes for Figure 6H-42—Typical Application 42
Work in Vicinity of Exit Ramp

Guidance:
1. The guide signs should indicate that the ramp is open, and where the temporary ramp is located. However, if the ramp is closed, guide signs should indicate that the ramp is closed.
2. When the exit ramp is closed, a black on orange EXIT CLOSED panel should be placed diagonally across the interchange/intersection guide signs.
3. The design criteria contained in the AASHTO “Policy on the Geometric Design of Highways and Streets” should be used for determining the alignment (see Section 1A.11).

Standard:
4. A temporary EXIT sign shall be located in the temporary gore. For better visibility, it shall be mounted a minimum of 7 ft from the pavement surface to the bottom of the sign.

Option:
An alternative procedure that may be used is to channelize exiting vehicular traffic onto the right shoulder and close the lane as necessary.
6. For Short-Term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a supplemental plaque.
Figure 6H-42. Work in Vicinity of Exit Ramp (TA-42)

Note: See Table 6H-2 for the meaning of symbols.

Typical Application 42
Notes for Figure 6H-43—Typical Application 43
Partial Exit Ramp Closure

Guidance:

1. Truck off-tracking should be considered when determining whether the minimum lane width of 10 ft is adequate (see Section 6G.07).
Figure 6H-43. Partial Exit Ramp Closure (TA-43)

Note: See Table 6H-2 for the meaning of symbols.
Notes for Figure 6H-44—Typical Application 44
Work in Vicinity of Entrance Ramp

Guidance:
1. An acceleration lane of sufficient length should be provided whenever possible as shown on the left diagram.

Standard:
2. For the information shown on the diagram on the right side of the typical application, where inadequate acceleration distance exists for the temporary entrance, the YIELD sign shall be replaced with STOP signs (one on each side of the approach).

Guidance:
3. When used, the YIELD or STOP sign should be located so that ramp vehicular traffic has adequate sight distance of oncoming mainline vehicular traffic to select a reasonably safe gap in the mainline vehicular traffic flow. Also, a longer acceleration lane should be provided beyond the sign to reduce the gap size needed. If insufficient gaps are available, consideration should be given to closing the ramp.
4. Where STOP signs are used, a temporary stop line should be placed across the ramp at the desired stop location.
5. The mainline merging taper with the arrow panel at its starting point should be located sufficiently in advance so that the arrow panel is not confusing to drivers on the entrance ramp, and so that the mainline merging vehicular traffic from the lane closure has the opportunity to stabilize before encountering the vehicular traffic merging from the ramp.
6. If the ramp curves sharply to the right, warning signs with Advisory Speed Limits located in advance of the entrance terminal should be placed in pairs (one on each side of the ramp).

Option:
7. A Type B high-intensity warning flasher with a red lens may be placed above the STOP sign.
8. Where the acceleration distance is significantly reduced, a supplemental plaque may be placed below the YIELD AHEAD sign reading NO MERGE AREA.
9. For Short-Term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a supplemental plaque.
Figure 6H-44. Work in Vicinity of Entrance Ramp (TA-44)

Note: See Table 6H-2 for the meaning of symbols.
Notes for Figure 6H-45A&B—Typical Application 45A
Temporary Reversible Lane Using Movable Barriers

Support:
1. This application addresses one of several uses for movable barriers in highway work zones. In this example, one side of a 6-lane divided highway is closed to perform the work operation, and vehicular traffic is carried in both directions on the remaining 3-lane roadway by means of a median crossover. To accommodate unbalanced peak-period vehicular traffic volumes, the direction of travel in the center lane is switched to the direction having the greater volume, with the transfer typically being made twice daily. Thus, there are four vehicular traffic phases described as follows:
   a. Phase A—two travel lanes northbound and one lane southbound;
   b. Transition A to B—one travel lane in each direction;
   c. Phase B—one travel lane northbound and two lanes southbound; and
   d. Transition B to A—one travel lane in each direction.

The typical application on the left illustrates the placement of devices during Phase A. The typical application on the right shows conditions during the transition (Transition A to B) from Phase A to Phase B.

Guidance:
2. For the reversible-lane situation depicted, the ends of the movable barrier should terminate in a protected area or a crash cushion should be provided. During Phase A, the transfer vehicle should be parked behind the end of the movable barrier. During Phase B, the transfer vehicle should be parked behind the end of the movable barrier.

The transition shift from Phase A to B should be as follows:
   a. Change the signs in the northbound advance warning area and transition area from a LEFT LANE CLOSED to a LEFT TWO LANES CLOSED. Change the mode of the second northbound arrow panel from Caution to Right Arrow.
   b. Place channelizing devices to close the northbound center lane.
   c. Move the transfer vehicle from south to north to shift the movable barrier from the west side to the east side of the reversible lane.
   d. Remove the channelizing devices closing the southbound center lane.
   e. Change the signs in the southbound transition area and advance warning area from a LEFT TWO LANES CLOSED to LEFT LANE CLOSED. Change the mode of the second southbound arrow panel from Right Arrow to Caution.

3. Where the lane to be opened and closed is an exterior lane (adjacent to the edge of the traveled way or the work space), the lane closure should begin by closing the lane with channelizing devices placed along a merging taper using the same information employed for a stationary lane closure. The lane closure should then be extended with the movable-barrier transfer vehicle moving with vehicular traffic. When opening the lane, the transfer vehicle should travel against vehicular traffic. The merging taper should be removed in a method similar to a stationary lane closure.
Figure 6H-45A. Movable Barriers (TA-45A) Phase A

Note: Although leader lines point to signs on the right side of roadway, most signs should be installed on both sides of roadway.

Typical Application 45A
Notes for Figure 6H-45A&B—Typical Application 45B
Temporary Reversible Lane Using Movable Barriers

Support:
1. This application addresses one of several uses for movable barriers in highway work zones. In this example, one side of a 6-lane divided highway is closed to perform the work operation, and vehicular traffic is carried in both directions on the remaining 3-lane roadway by means of a median crossover. To accommodate unbalanced peak-period vehicular traffic volumes, the direction of travel in the center lane is switched to the direction having the greater volume, with the transfer typically being made twice daily.

Thus, there are four vehicular traffic phases described as follows:
   a. Phase A—two travel lanes northbound and one lane southbound;
   b. Transition A to B—one travel lane in each direction;
   c. Phase B—one travel lane northbound and two lanes southbound; and
   d. Transition B to A—one travel lane in each direction.

The typical application on the left illustrates the placement of devices during Phase A. The typical application on the right shows conditions during the transition (Transition A to B) from Phase A to Phase B.

Guidance:
2. For the reversible-lane situation depicted, the ends of the movable barrier should terminate in a protected area or a crash cushion should be provided. During Phase A, the transfer vehicle should be parked behind the end of the movable barrier. During Phase B, the transfer vehicle should be parked behind the end of the movable barrier.

The transition shift from Phase A to B should be as follows:
   a. Change the signs in the northbound advance warning area and transition area from a LEFT LANE CLOSED to a LEFT TWO LANES CLOSED. Change the mode of the second northbound arrow panel from Caution to Right Arrow.
   b. Place channelizing devices to close the northbound center lane.
   c. Move the transfer vehicle from south to north to shift the movable barrier from the west side to the east side of the reversible lane.
   d. Remove the channelizing devices closing the southbound center lane.
   e. Change the signs in the southbound transition area and advance warning area from a LEFT TWO LANES CLOSED to LEFT LANE CLOSED. Change the mode of the second southbound arrow panel from Right Arrow to Caution.

3. Where the lane to be opened and closed is an exterior lane (adjacent to the edge of the traveled way or the work space), the lane closure should begin by closing the lane with channelizing devices placed along a merging taper using the same information employed for a stationary lane closure. The lane closure should then be extended with the movable-barrier transfer vehicle moving with vehicular traffic. When opening the lane, the transfer vehicle should travel against vehicular traffic. The merging taper should be removed in a method similar to a stationary lane closure.
**Figure 6H-45B. Movable Barriers (TA-45B) Transition A-B**

- **Note:** Although leader lines point to signs on the right side of roadway, most signs should be installed on both sides of roadway.

- **Note:** See Table 6H-2 for the meaning of symbols.

Typical Application 45B
Notes for Figure 6H-46—Typical Application 46
Work in Vicinity of Highway-Rail Grade Crossing

Guidance:
1. When highway-rail grade crossings exist either within or in the vicinity of roadway work activities, extra care should be taken to minimize the probability of conditions being created, either by lane restrictions, flagging, or other operations, where vehicles might be stopped within the highway-rail grade crossing, considered as being 15 ft on either side of the closest and farthest rail.

Standard:
2. If the queuing of vehicles across active rail tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the highway-rail grade crossing to prevent vehicles from stopping within the highway-rail grade crossing (as described in Note 1), even if automatic warning devices are in place.

Guidance:
3. Early coordination with the railroad company should occur before work starts.
4. In the example depicted, the buffer space of the activity area should be extended upstream of the highway-rail grade crossing (as shown) so that a queue created by the flagging operation will not extend across the highway-rail grade crossing.
5. The DO NOT STOP ON TRACKS sign should be used on all approaches to a highway-rail grade crossing within the limits of a TTC zone.

Option:
6. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
7. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:
8. When used, the BE PREPARED TO STOP sign should be located before the Flagger symbol sign.

Standard:
At night, flagger stations shall be illuminated, except in emergencies.
Figure 6H-46. Work in Vicinity of Highway-Rail Grade-Crossing (TA-46)

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Note: See Table 6H-2 for the meaning of symbols.
CHAPTER 6I. CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS

Section 6I.01 General

Support: Whenever the acronym “TTC” is used in this Chapter, it refers to “temporary traffic control”.

Standard: The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support: A traffic incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic.

A traffic incident management area is an area of a highway where temporary traffic controls are imposed by authorized officials in response to a road user incident, natural disaster, hazardous material spill, or other unplanned incident. It is a type of TTC zone and extends from the first warning device (such as a sign, light, or cone) to the last TTC device or to a point where vehicles return to the original lane alignment and are clear of the incident.

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 4 hours;
B. Intermediate—expected duration of 60 minutes to 4 hours; and
C. Minor—expected duration under 60 minutes.

The primary functions of TTC at a traffic incident management area are to move road users reasonably safely and expeditiously past or around the traffic incident, to reduce the likelihood of secondary traffic crashes, and to preclude unnecessary use of the surrounding local road system. Examples include a stalled vehicle blocking a lane, a traffic crash blocking the traveled way, a hazardous material spill along a highway, and natural disasters such as floods and severe storm damage.

Guidance: In order to reduce response time for traffic incidents, highway agencies, appropriate public safety agencies (law enforcement, fire and rescue, emergency communications, emergency medical, and other emergency management), and private sector responders (towing and recovery and hazardous materials contractors) should mutually plan for occurrences of traffic incidents along the major and heavily traveled highway and street system.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Responders arriving at a traffic incident should, estimate the magnitude of the traffic incident, the expected time duration of the traffic incident, and the expected vehicle queue length, and then should initiate procedures to have the appropriate temporary traffic controls set up for these estimates.

Option: Warning and guide signs used for TTC traffic incident management situations may have a black legend and border on a fluorescent pink background (see Figure 6I-1).

Support: While some traffic incidents might be anticipated and planned for, emergencies and disasters might pose more severe and unpredictable problems. The ability to quickly install proper temporary traffic controls might greatly reduce the effects of an incident, such as secondary crashes or excessive traffic delays. An essential part of fire, rescue, spill clean-up, highway agency, and enforcement activities is the proper control of road users through the traffic incident management area in order to protect responders, victims, and other personnel at the site while providing reasonably safe traffic flow. It is desirable for these statutes to provide sufficient flexibility in the authority for, and implementation of, TTC to respond to the needs of changing conditions found in traffic
Option:
For traffic incidents, particularly those of an emergency nature, TTC devices on hand may be used for the initial response as long as they do not themselves create unnecessary additional hazards.

Section 6I.02 Major Traffic Incidents
Support:
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 4 hours.

Guidance:
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.

Support:
A road closure can be caused by a traffic incident such as a road user crash that blocks the traveled way. Road users are usually diverted through lane shifts or detoured around the traffic incident and back to the original roadway. A combination of traffic engineering and enforcement preparations is needed to determine the detour route, and to install, maintain or operate, and then to remove the necessary traffic control devices when the detour is terminated. Large trucks are a significant concern in such a detour, especially when detouring them from a controlled-access roadway onto local or arterial streets.

During traffic incidents, large trucks might need to follow a route separate from that of automobiles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous material might need to follow a different route from other vehicles.

Some traffic incidents such as hazardous material spills might require closure of an entire highway. Through road users must have adequate guidance around the traffic incident. Maintaining good public relations is desirable. The cooperation of the news media in publicizing the existence of, and reasons for, traffic incident management areas and their TTC can be of great assistance in keeping road users and the general public well informed.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by inter-agency planning that includes representatives of highway and public safety agencies.
Guidance:
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 approaching traffic of the end of a queue.

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

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:
If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:
When flares or other approved substituted devices are used to initiate TTC at traffic incidents, more permanent traffic control devices should replace them as soon as practical.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Section 6I.03 Intermediate Traffic Incidents
Support:
Intermediate traffic incidents typically affect travel lanes for a time period of 60 minutes to 4 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.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by inter-agency planning that includes representatives of highway and public safety agencies.

Guidance:
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 approaching traffic of the end of a queue.

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

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:
If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:
When flares or other approved substituted devices are used to initiate TTC at traffic incidents, more permanent traffic devices should replace them as soon as practical.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Section 6I.04 Minor Traffic Incidents
Support:
Minor traffic incidents are typically disabled vehicles and minor crashes that result in lane closures of less than 60 minutes. On-scene responders are typically law enforcement and towing companies, and occasionally highway agency service patrol vehicles.

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:

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

Section 61.05 Use of Emergency-Vehicle Lighting

Support:

The use of emergency-vehicle lighting (such as high-intensity rotating, flashing, oscillating, or strobe lights) is essential, especially in the initial stages of a traffic incident, for the safety of emergency responders and persons involved in the traffic incident, as well as road users approaching the traffic incident. Emergency-vehicle lighting, however, provides warning only and provides no effective traffic control. It is often confusing to road users, especially at night. Road users approaching the traffic incident from the opposite direction on a divided facility are often distracted by emergency-vehicle lighting and slow their vehicles to look at the traffic incident posing a hazard to themselves and others traveling in their direction.

The use of emergency-vehicle lighting can be reduced if good traffic control has been established at a traffic incident scene. This is especially true for major traffic incidents that might involve a number of emergency vehicles. If good traffic control is established through placement of advanced warning signs and traffic control devices to divert or detour traffic, then public safety agencies can perform their tasks on scene with minimal emergency-vehicle lighting.

Guidance:

Public safety agencies should examine their policies on the use of emergency-vehicle lighting, especially after a traffic incident scene is secured, with the intent of reducing the use of this lighting as much as possible while not endangering those at the scene. Special consideration should be given to reducing or extinguishing forward facing emergency-vehicle lighting, especially on divided roadways, to reduce distractions to on-coming road users.

Vehicle headlights not needed for illumination, or to provide notice to other road users of the incident response vehicle being in an unexpected location, should be turned off at night.