SUBJECT: Revisions to Publication 213 Temporary Traffic Control Guidelines

INFORMATION AND SPECIAL INSTRUCTIONS:
This replaces Publication 213 dated January 2006. Publication 213 dated February 2008 Attached

The following is a list of some important changes:

General Notes
a) Note 9 – worker safety apparel
b) Note 15 - equipment and vehicle storage
c) Note 23 – shadow vehicle optional for mowing operations

New Figures
a) PATA Sign Layout
b) PATA Barrier Transition
c) Appendix B – Temporary Barrier Deflection Table

Revised Figures (changes made on multiple figures)
a) Sign spacing based on types of highways labeled as “Conditions”
b) A shadow vehicle with a Truck Mounted Attenuator (TMA) is required on expressways or freeways. See notes on figures.
c) Other minor corrections made to various PATA figures.
Temporary Traffic Control Guidelines

PUBLICATION 213

(67 PA CODE, CHAPTER 212)

Think Safety First

Pub 213 (02-08)
Application

Publication 213 applies to contractors; utilities; Federal, State, county, township and municipal governments; and others performing applicable construction, maintenance, emergency or utility/permit work on highways or so closely adjacent to a highway that workers, equipment or materials encroach on the highway or interfere with the normal movement of traffic.

The *Manual on Uniform Traffic Control Devices (MUTCD)* defines the term "temporary traffic control" as: "Temporary Traffic Control Zone - an area of a highway where road user conditions are changed because of a work zone or incident by the use of temporary traffic control devices, flaggers, uniformed law enforcement officers, or other authorized personnel."

The traffic control schemes shown in this publication are normally applicable for both urban and rural areas. Since it is not practical to provide detailed guidelines for all the situations that may conceivably arise, applications are presented for only the most common situations. These are minimum desirable applications for normal situations, and additional protection may be needed when special complexities or potential hazards prevail. The protection prescribed for each situation shall be consistent with the general provisions of *Title 67 Pa. Code, Chapter 212, Official Traffic Control Devices* and the national *Manual On Uniform Traffic Control Devices* as issued by the Federal Highway Administration and should be based on common sense; engineering judgment; the speed and volume of traffic; the duration of the operation; the exposure to potential hazards; the physical features of the highway including horizontal alignment, vertical alignment and the presence of intersections and driveways; and other important factors.

**TABLE OF CONTENTS**

Reference Guide For Typical Figures (1 sheet)  
General Notes (4 sheets)  
PATA Sign Layout (1 sheet)  
PATA Barrier Transition (1 sheet)  
Act 229 (1 sheet)  
PATA Figures (68 sheets)  
Appendix A - Temporary/Portable Traffic Signals general notes and applications  
Appendix B - Temporary Barrier Deflection Distance Table
<table>
<thead>
<tr>
<th>Type of Highway</th>
<th>Condition</th>
<th>Figure Number</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Short-Term Operation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>Work Area Adjacent to Any Roadway</td>
<td>PATA 5</td>
</tr>
<tr>
<td></td>
<td>Numerous Nighttime Work Areas on or Beyond the Shoulder</td>
<td>PATA 7</td>
</tr>
<tr>
<td></td>
<td>Minor Encroachment</td>
<td>PATA 8</td>
</tr>
<tr>
<td></td>
<td>Major Encroachment</td>
<td>PATA 9</td>
</tr>
<tr>
<td></td>
<td>Work Area in the Center of the Roadway</td>
<td>PATA 9a</td>
</tr>
<tr>
<td></td>
<td>Work Area in the Left or Right Side of the Roadway</td>
<td>PATA 9a L2</td>
</tr>
<tr>
<td></td>
<td>Work Area in the Center of an Intersection</td>
<td>PATA 9b</td>
</tr>
<tr>
<td></td>
<td>Surveying Along Centerline of Road with Low Traffic Volumes</td>
<td>PATA 9c</td>
</tr>
<tr>
<td></td>
<td>Flagging</td>
<td>PATA 10a</td>
</tr>
<tr>
<td></td>
<td>Intersection Flagging</td>
<td>PATA 10b</td>
</tr>
<tr>
<td></td>
<td>Single Flagger</td>
<td>PATA 10c</td>
</tr>
<tr>
<td></td>
<td>Stop Sign-Controlled Lane Closure</td>
<td>PATA 10d</td>
</tr>
<tr>
<td></td>
<td>Self-Regulating Lane Closure</td>
<td>PATA 10e</td>
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<td></td>
<td>Flagger at One End, AFAD at the Other End</td>
<td>PATA 10AFAD-1</td>
</tr>
<tr>
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<td>AFAD With Flagger at Both Ends</td>
<td>PATA 10AFAD-2</td>
</tr>
<tr>
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<td>AFAD At Both Ends, Single Flagger Centrally Located</td>
<td>PATA 10AFAD-3</td>
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<tr>
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<td>Road Closure</td>
<td>PATA 11d,f,11f</td>
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<tr>
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<td>Moving Lane Closure</td>
<td>PATA 12</td>
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<tr>
<td></td>
<td>Temporary Traffic Control Signals</td>
<td>PATA 26e PS</td>
</tr>
<tr>
<td></td>
<td>Portable Traffic Control Signals</td>
<td>PATA 26e PL</td>
</tr>
<tr>
<td></td>
<td>Temporary Roadway</td>
<td>PATA 27</td>
</tr>
<tr>
<td></td>
<td>Work Area in the Single-Lane Approach</td>
<td>PATA 13a</td>
</tr>
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<td>Work Area In Both Lanes of the Two-Lane Approach</td>
<td>PATA 13b</td>
</tr>
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<td>Work Area in One-Lane Approach and Left Lane of Two-Lane Approach</td>
<td>PATA 13c</td>
</tr>
<tr>
<td></td>
<td>Work Area In the Left or Right Lane of the Two-Lane Approach</td>
<td>PATA 16</td>
</tr>
<tr>
<td></td>
<td>Work Area In One of the Through Lanes</td>
<td>PATA 14</td>
</tr>
<tr>
<td></td>
<td>Work Area in the Two-Way Left Turn Lane</td>
<td>PATA 15</td>
</tr>
<tr>
<td></td>
<td>Work Area in the Left or Right Lane</td>
<td>PATA 16</td>
</tr>
<tr>
<td></td>
<td>Work Area in the Center Lane of a Three-Lane Approach</td>
<td>PATA 19</td>
</tr>
<tr>
<td></td>
<td>Work Area Requiring the Closure of One Side of a Four-Lane Undivided Highway</td>
<td>PATA 17</td>
</tr>
<tr>
<td></td>
<td>Work Area in a Two-Way Left Turn Lane</td>
<td>PATA 15</td>
</tr>
<tr>
<td></td>
<td>Work Area in the Left or Right Lane</td>
<td>PATA 18</td>
</tr>
<tr>
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<td>Work Area in the Center Lane of a Three-Lane, One-Way Roadway</td>
<td>PATA 19</td>
</tr>
<tr>
<td></td>
<td>Work Area in Two Adjacent Lanes</td>
<td>PATA 20</td>
</tr>
<tr>
<td></td>
<td>Lane Closure Near a Freeway or Expressway Exit Ramp</td>
<td>PATA 21</td>
</tr>
<tr>
<td></td>
<td>Lane Closure Near a Freeway or Expressway Entrance Ramp</td>
<td>PATA 22</td>
</tr>
<tr>
<td></td>
<td>Two-Way Traffic on One Roadway of a Normally Divided Highway</td>
<td>PATA 38</td>
</tr>
<tr>
<td></td>
<td>Detour of a Numbered Traffic Route</td>
<td>PATA 39a</td>
</tr>
<tr>
<td></td>
<td>Detour of an Unnumbered Traffic Route</td>
<td>PATA 39b</td>
</tr>
<tr>
<td></td>
<td>Sidewalk Detour or Diversion</td>
<td>PATA 40</td>
</tr>
<tr>
<td></td>
<td>Crosswalk Closures and Pedestrian Detours</td>
<td>PATA 41</td>
</tr>
<tr>
<td></td>
<td>Temporary Bituminous Roadway Strip Patterns</td>
<td>PATA 42</td>
</tr>
</tbody>
</table>

Short-Term Stationary Operation -- Work that occupies a location up to 24 hours.
Long-Term Stationary Operation -- Work that occupies a location more than 24 hours.
Mobile Operation -- Any operation that moves intermittently or continuously.

REFERENCE GUIDE FOR TYPICAL FIGURES
GENERAL NOTES

1. All distances may be adjusted slightly to fit field conditions.

2. All signs shall be 36" x 36" for conventional roadways and 48" x 48" for expressways and freeways unless otherwise noted.

3. Traffic Control Plans may deviate from the typical applications shown in this publication to allow for conditions and requirements of a particular site or jurisdiction.

4. The three categories for work duration of temporary traffic control are:
   a. Short-Term Stationary Operation - Work that occupies a location up to 24 hours.
   b. Long-Term Stationary Operation - Work that occupies a location more than 24 hours.
   c. Mobile Operation - Work that moves intermittently or continuously.

5. The EMERGENCY AHEAD (W25-14), SURVEY CREW (W21-6), MOVING NEXT (1) MILES (W21-14), and BRIDGE INSPECTION AHEAD (W21-111) signs may be used as an alternate to the ROAD WORK AHEAD sign (W20-1) or ROAD WORK NEXT (1) MILES (G20-1) where appropriate.

6. The needs and control of all road users through the work zone (including motorists, bicyclists, pedestrians and persons with disabilities in accordance with the Americans with Disabilities Act of 1990) shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

7. Sign sheeting shall be of an approved type and listed in Publication 35 (Bulletin 15).

8. All warning sign colors shall have orange background and black border and legends unless otherwise specified.

9. All workers including flaggers shall wear a helmet and high-visibility fluorescent orange or yellow-green apparel with retroreflective material that meets ANSI 107-2004 Class 2 risk exposure anytime day or night. Class 3 high-visibility apparel should be considered for additional flagger visibility at night. During inclement weather, high-visibility fluorescent rain gear may be used.

   Worker - as defined in FHWA final regulation (23 CFR Part 634).

   Workers means people on foot whose duties place them within the right-of-way of a Federal-aid highway, such as highway construction and maintenance forces, survey crews, utility crews, responders to incidents within the highway right-of-way, and law enforcement personnel when directing traffic, investigating crashes, and handling lane closures, obstructed roadways, and disasters within the right-of-way of a Federal-aid highway.

10. For guidance on deflection distances refer to PUB 13M (TM-2) Design Manual 2 in Chapter 12 Table 12.3 (English) Guide Rail and Median Barrier Systems page 12-10 and for temporary barrier see Appendix B.

11. Provide a 100 to 250 foot buffer space prior to the work space in a closed lane. The buffer space shall be clear of equipment, vehicles, materials, or workers.

12. Orange flags or flashing warning lights may be used in conjunction with signs.

13. Traffic Cones shall only be used during short term operations.
GENERAL NOTES (CONTINUED)

14. Definitions:
   a. Urban Street - A type of street normally characterized by relatively low speeds, wide ranges of traffic volumes, narrower lanes, frequent intersections and driveways, significant pedestrian traffic, and more businesses and houses.
   b. Expressway - A divided arterial highway for through traffic with partial control of access and generally with grade separations at major intersections.
   c. Freeway - A limited access highway to which the only means of ingress and egress is by interchange ramps.

15. Equipment, vehicle and material storage.
   (1) Except as indicated in paragraph (2), at the end of the workday, and whenever practical during the workday, based on actual site conditions, equipment, vehicles and material shall be stored a minimum of 30 feet from the edge of the nearest open travel lane or they shall be adequately stored behind a longitudinal (including guiderail) barrier, or more than 2 feet behind the curb. Design Manual 2, Chapter 12, Table 12.3 presents minimum unobstructed distances that shall be maintained behind various guiderail systems and refer to Appendix B for temporary barrier deflection distances.
   (2) If site conditions prevent equipment, vehicles and material from being stored as indicated in paragraph (1), or if these items are placed for use or operation on or near the highway surface within the work zone, then barricades, drums or other protective devices shall be placed around the equipment, vehicles and material storage site, to warn and protect the traveling public consistent with this publication.
   (3) Workers are not permitted to park their vehicles within the highway right-of-way in a manner that compromises the safety of workers, pedestrians or the traveling public.

16. Neither work activity nor storage of equipment, vehicles, or material should occur within a buffer space.

17. Guidelines for installation and removal of traffic control setups.
   (a) Required advance warning signs should be installed first so that protection is provided when channelizing devices are installed near the work area. If work zone signing is necessary for both directions of travel, sign installation should begin with the advance warning sign located furthest from the work area and on the side of the roadway opposite the work area, sign installation should proceed down the roadway toward the work area. After the necessary signs are erected on the side of the roadway opposite the work area, sign installation may begin for the other direction of travel, beginning with the sign furthest from the work area. In the process of installing the work zone signing, existing signs with conflicting messages shall be completely covered, removed or modified.
   (b) If the work area is such that flagging operations are necessary, the flaggers may begin flagging operations after the advance warning signs are in place. Otherwise, the installation of channelizing devices at the work area can begin after the placement of the advance warning signs. These devices should also be installed in the direction of travel.
   (c) If available, a shadow vehicle may be placed between approaching traffic and the workers who are installing channelizing devices around the work area. After channelizing devices are installed, the vehicle may be removed or moved inside the work area and work may begin.
   (d) After work is completed, the work zone traffic control scheme may be dismantled. The channelizing devices which surround the work site should be removed first, in reverse order as it was installed (opposite the flow of traffic), followed by flaggers which may have been used. The work area signing may then be removed and normal traffic patterns restored.
18. As a general rule, signs shall be located on the right-hand side of the roadway. On divided highways and one-way highways where it is physically possible, signs should also be placed on the left-hand side of the roadway. (See PATA Sign Layout Figure)

19. Please refer to Publication 408, Section 901.3 ([]) for traffic control requirements adjacent to pavement edge or shoulder dropoffs during construction.

20. Portable Sign Stands shall not be used for long term operations.

21. A three cone advance setup may be used to alert oncoming traffic of a flagger during a flagging operation. This three cone advance setup, when used, is in addition to the traffic control setup being used at the time. The three cone advance setup is located in the center of the roadway. The three cone advance setup should be located at a distance from 150 feet in advance of the flagger and a distance no greater than the W20-TA sign. Each cone in the 3-cone setup shall be spaced between 10 to 50 feet apart as shown in the following figure:

22. When used with a truck-mounted attenuator (TMA), the shadow vehicle must be loaded to the weight recommended by the manufacturer of the TMA.

23. Shadow Vehicles for mowing operations are optional.

24. See MUTCD chapter 6 and Publication 212 for additional guidelines and requirements.

25. Provisions and guidelines governing temporary traffic control for emergency work and incident management are given in Title 67 Pa. Code Chapter 212, Official Traffic Control Devices, §212.414 and in Chapter 6I in the MUTCD.

26. Consider using temporary longitudinal barrier to protect workers in all freeway and multi-lane work zones if the speed limit is 45 mph or greater, workers are present within one lane width of a active travel lane and a lane or shoulder is closed 24 hours per day for more than 2 weeks.
### Table 1: Formulas for Determining Taper Lengths

<table>
<thead>
<tr>
<th>S</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 MPH or less</td>
<td>L = ( \frac{W}{60} )</td>
</tr>
<tr>
<td>45 MPH or more</td>
<td>L = WS</td>
</tr>
</tbody>
</table>

W = width of offset in feet

### Table 2: Merging Taper Lengths

<table>
<thead>
<tr>
<th>S (MPH)</th>
<th>W (ft)</th>
<th>L (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>110</td>
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<tr>
<td></td>
<td>11</td>
<td>720</td>
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<td></td>
<td>12</td>
<td>780</td>
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W = width of offset in feet

### Table 3: Other Taper Lengths

<table>
<thead>
<tr>
<th>Type of Taper</th>
<th>L Min,</th>
</tr>
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<tr>
<td>Merging Taper</td>
<td>L</td>
</tr>
<tr>
<td>Shifting Taper</td>
<td>0.5L</td>
</tr>
<tr>
<td>Shoulder Taper</td>
<td>0.3L</td>
</tr>
<tr>
<td>One-Lane, Two-Way Traffic Taper</td>
<td>10° Max.</td>
</tr>
<tr>
<td>Downstream Taper</td>
<td>10° Max./Lane</td>
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### Table 4: Advisory Speed for Freeways and Expressways

<table>
<thead>
<tr>
<th>S (MPH)</th>
<th>Work Area Speed Limit</th>
<th>Advisory Speed in Advance of the Work Area</th>
<th>Signs from Beginning of Work Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MPH 5th</td>
<td>4th</td>
<td>3rd</td>
</tr>
<tr>
<td>65</td>
<td>55</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>65</td>
<td>50*</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>65</td>
<td>45*</td>
<td>55</td>
<td>50</td>
</tr>
<tr>
<td>55</td>
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<td>30</td>
<td>20</td>
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<td>20</td>
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</tbody>
</table>

* Work area speed limits less than 25 MPH or a reduction of more than 10 MPH below the normal speed limit should be used only when required by restrictive features in the work zone and require prior approval. See Publication 212 for further guidelines.

### Table 5: Flashing Arrow Panel Guidelines

<table>
<thead>
<tr>
<th>Panel Type</th>
<th>Size (Inches)</th>
<th>Application</th>
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<tbody>
<tr>
<td>Δ**</td>
<td>48x24</td>
<td>Low-speed urban Typically 25-30 MPH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typically 25-30 MPH</td>
</tr>
<tr>
<td>B**</td>
<td>60x30</td>
<td>Intermediate-speed facility, typically 35-40 MPH and Mobile Operations</td>
</tr>
<tr>
<td>C**</td>
<td>96x48</td>
<td>Freeway and Expressway Other high-speed, high-volume roadways Typically 45 MPH or greater</td>
</tr>
<tr>
<td>D**</td>
<td>Length of Arrow=48 Width of Arrowhead=24</td>
<td>Low-speed urban, typically 25-30 MPH Short-term work not to exceed one daylight period For use on authorized vehicles only</td>
</tr>
</tbody>
</table>

**Type A, B and C arrow panels shall have solid rectangular appearances. The Type D arrow panel shall conform to the shape of the arrow.**
### POST MOUNTED SIGNS

#### RURAL AREAS

- 6'-12' Desirable
- 2' Min.
- 5' Min.
- Edge of Travelled Way
- See Note 6

#### URBAN AREAS

- 2' Min.
- 6' Min.
- Edge of Travelled Way
- See Note 6

**NOTES**

1. Signs located on both the left and right sides of a roadway shall conform with these guidelines.
2. Higher mounting heights are desirable and may be necessary where construction equipment, material, or other obstructions such as parking or pedestrian activity are present.
3. In urban areas, a clearance of 1' from the curb face is permissible where sidewalk width is limited or where existing poles are close to the curb.
4. Within work zones, it is sometimes necessary or desirable to position signs within the roadway itself. All signs erected within a roadway or a shoulder shall be mounted on portable supports or Type III barricades.
5. The length of Type III barricade rails shall equal or exceed the widest horizontal dimension of the widest sign installed on the barricade or a minimum of 4' which ever is larger.
6. The supplemental plaque may also be centered under the sign.
7. Portable sign support shall only be used during short term operation.

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### SIGNS MOUNTED ON TYPE III BARRICADES

#### RURAL AREAS

- 6'-12' Desirable
- 2' Min.
- 5' Min.
- Edge of Travelled Way
- See Note 5

#### URBAN AREAS

- 2' Min.
- 5' Min.
- Edge of Travelled Way
- See Note 5

**NOTES**

1. Signs located on both the left and right sides of a roadway shall conform with these guidelines.
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6. The supplemental plaque may also be centered under the sign.
7. Portable sign support shall only be used during short term operation.

---

### SIGNS MOUNTED ON PORTABLE SUPPORTS

#### (See Note 7)

- 6'-12' Desirable
- 2' Min.
- Edge of Travelled Way
- See Note 5

**NOTES**

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5. The length of Type III barricade rails shall equal or exceed the widest horizontal dimension of the widest sign installed on the barricade or a minimum of 4' which ever is larger.
6. The supplemental plaque may also be centered under the sign.
7. Portable sign support shall only be used during short term operation.
NOTES:
1. Transition must be used when the following exist:
   a) When an attenuating device is used to shield blunt end of 50" high barrier.
   b) When transitioning from 50" to 32" high barrier.
2. See RC-57W, sheet 6 in PennDOT Standards (Pub 72W) for additional details.
ACT 229 GUIDELINES

1. The installation of the R22-1, W21-19 and W21-20 signs and the flashing white lights are not required for any of the following situations:
   a. Mobile operations.
   b. Operations 1 hour or less in duration.
   c. Stationary work where the daily duration of the construction, maintenance, or utility operation is less than 12 hours and all traffic-control devices are removed from the highway at the completion of the daily operation.
   d. The normal speed limit is 45 MPH or less.
   e. The work is in response to emergency work or conditions such as a major storm.

2. When used, erect the R22-1 Sign as the first sign on each primary approach to the work zone, generally at a distance of 250' to 1000' prior to the first warning sign.

3. When used, erect the W21-19 Sign as close as practical to the beginning of the active work zone.

4. When a construction, maintenance or utility project has more than one active work zone and the active work zones are separated by a distance of more than 1 mile, signs for each active work zone shall be erected.

5. The W21-19 light shall be activated only when workers are present, and deactivated when workers are not anticipated during the next 60 minutes.

6. When the work zone is on an expressway or freeway, appropriate Act 229 signing and lights shall be installed at on-ramp approaches to the work zone.
CONDITION 1: All Highways (except Freeways and Expressways)
   A = 500 ft., W20-1 sign distance plaque to read 500 ft. or "AHEAD"
   D = 2 times the normal speed limit

CONDITION 2: For Urban Streets
   A = 200 ft. and sign distance plaque to read "AHEAD"
   D = 2 times the normal speed limit

CONDITION 3: For Freeways and Expressways
   A = 1000 ft., W20-1 sign distance plaque to read 1000 ft. or "AHEAD"
   D = 2 times normal speed limit

NOTES
1. Traffic control devices are not required if the work space is outside the highway right-of-way, behind barrier, more than 2' behind curb, or 15' or more from the edge of any roadway.
2. For divided highways and one-way highways where it is physically possible, advance warning signs should also be placed on the left-hand side of the roadway.
3. The W20-1 Sign may be replaced with other appropriate signs (Low Shoulder sign, No Guide Rail sign, and so forth).
4. For operations 60 minutes or less, all traffic control devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.
5. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways and Freeways. Use of a TMA is Optional on all other Highways when a shadow vehicle is used.
CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.

CONDITION 2: For Urban Streets
A = 200 ft. and sign distance plaque to read "AHEAD"

CONDITION 3: For Freeways and expressways
A = 1000 ft.

NOTES
1. This figure applies for operations that move intermittently or continuously at an average speed of more than 1 MPH (88 ft/min).
2. Traffic control devices are not required if the work zone is outside the highway right-of-way, behind barrier, more than 2' behind curb, or 15' or more from the edge of any roadway.
3. For divided highways and one-way highways where it is physically possible, advance warning signs should also be placed on the left-hand side of the roadway.
4. For operations 60 minutes or less, all traffic control devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.
5. For a work area greater than 3 miles, a second G20-1 sign may be installed at the end of the first 3 mile segment.
6. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways and Freeways. Use of a TMA is optional on all other highways when a shadow vehicle is used.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)

\[ A = 500 \text{ ft.}, \ W20-1 \text{ sign distance plaque to read } 500 \text{ ft. or "AHEAD"} \]

\[ D = 2 \times \text{ the normal speed limit} \]

CONDITION 2: For Urban Streets

\[ A = 200 \text{ ft.}, \text{ and sign distance plaque to read "AHEAD"} \]

\[ D = 2 \times \text{ the normal speed limit} \]

NOTES

1. If the work area is completely within a parking lane and parking is present, the taper or the vehicle with an activated or revolving yellow light is not required.
2. When paved shoulders having a width of 8' or more are closed, channelizing devices should be used to close the shoulder.
3. For operations of 15 minutes or less:
   a. The W20-1 Sign is not required.
   b. All channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is present in advance of the work space.
4. Additional signs may be appropriate (Road Narrows sign, No Guide Rail sign, and so forth).
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)

\[ A = 500 \text{ ft.} \]

CONDITION 2: For Urban Streets

\[ A = 200 \text{ ft.} \]

**NOTES**

1. Where traffic is required to use a shoulder, it must be a paved shoulder that is in good condition both during the period it is being used by traffic and also after the work is completed.
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 shifting taper.
3. Parking shall be prohibited where required. Coordinate with local authorities.
**Publication 213**

**Short-Term Stationary Operation**

**Two-Lane, Two-Way Roadway - Work Area in the Center of the Roadway**

---

**Distance Plaques on Advance Warning Signs**

**Example:** either all XXX ft. or all "AHEAD"

**Condition 1:** All Highways (except Freeways and Expressways)

A = 500 ft., W20-1 sign distance plaque to read 500 ft. or "AHEAD"

**Condition 2:** For Urban Streets

A = 200 ft. and sign distance plaque to read "AHEAD"

---

**Notes:**

1. Where traffic is required to use a shoulder, it must be a paved shoulder that is in good condition both during the period it is being used by traffic and also after the work is completed.

2. 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.

3. For operations 15 minutes or less, channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is present in advance of the work area and two, 10 ft minimum width lanes can be maintained past the work area.

4. Parking shall be prohibited where required. Coordinate with local authorities.
PUBLICATION 213
LONG-TERM STATIONARY OPERATION
TWO-LANE, TWO-WAY ROADWAY - WORK AREA IN THE CENTER OF THE ROADWAY

**See General Notes, Tables, and Legend Drawing for Taper Length (L).**

Install temporary double yellow line

Install temporary white edge line

$\frac{1}{2} L \text{ Min.}^{**}$

$\frac{1}{2} D \text{ Max.}$

10' Min.

Install temporary white edge line

E A B C

Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)

A = 500 ft.
B = 500 ft., WS-5 sign distance plaque to read 1000 ft.
C = 500 ft., W20-1 sign distance plaque to read 1500 ft.

CONDITION 2: For Urban Streets

A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

NOTES

1. Where traffic is required to use a shoulder, it must be a paved shoulder that is in good condition both during the period it is being used by traffic and also after the work is completed.
2. Travel lanes shall have a minimum width of 10 feet as measured from the near edge of the channelizing devices to the edge of pavement or the outside edge of paved shoulder.
3. Parking shall be prohibited where required. Coordinate with local authorities.
4. If work area is in a passing zone, apply a temporary double yellow line over the passing zone markings on the approaches to the work area. Install R4-1 DO NOT PASS signs, 24" x 30", and cover any conflicting signs indicating a passing zone.
5. Remove conflicting pavement markings.

<table>
<thead>
<tr>
<th>All Highways (except Freeway and Expressway)</th>
<th>D</th>
<th>E</th>
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</thead>
<tbody>
<tr>
<td>D = 50 ft.</td>
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</table>

*Distances may be increased for downgrades or other conditions that affect stopping sight distance.

PATA
9a L1
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W5-5 sign distance plaque to read 1000 ft.
C = 500 ft., W20-1 sign distance plaque to read 1500 ft.

CONDITION 2: For Urban Streets
A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

NOTES:
1. Where traffic is required to use a shoulder, it must be a paved shoulder that is in good condition both during the period it is being used by traffic and also after the work is completed.
2. Travel lanes shall have a minimum width of 10 feet as measured from the near edge of the channelizing devices to the edge of pavement or the outside edge of paved shoulder.
3. Parking shall be prohibited where required. Coordinate with local authorities.
4. If work area is in a passing zone, apply a temporary double yellow line over the passing zone markings on the approaches to the work area, install R4-1 DO NOT PASS signs, 24"x30", and cover any conflicting signs indicating a passing zone.
5. Remove conflicting pavement markings.
6. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be 1/2 D Max.
7. 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 shifting taper.
Distance plaques on Advance Warning signs shall be the same series type.
Example: either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways)
- A = 500 ft., W20-1 sign distance plaque to read 500 ft. or "AHEAD"
- D = 2 times the normal speed limit

**CONDITION 2:** For Urban Streets
- A = 200 ft. and sign distance plaque to read "AHEAD"
- D = 2 times the normal speed limit

**NOTES**

1. For operations 15 minutes or less in duration, channelizing devices may be eliminated.
   - If a vehicle with an activated flashing or revolving yellow light is present in the work area.
2. All lanes should be a minimum of 10 ft in width as measured to the near face of the channelizing device.
3. When vehicular traffic does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 ft may be used.
4. Left turns may be prohibited as required by geometric conditions.
CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft.
D = 2 times normal speed limit

CONDITION 2: For Urban Streets
A and B = 200 ft.
D = 2 times normal speed limit

NOTES
1. Cones should be placed 6 inches to 12 inches on either side of the centerline.
2. As shown on this figure, a flagger should be used to warn workers who cannot watch road users.
3. This figure should be used only where the ADT is not greater than approximately 1500, or the average 5-minute traffic volume during the period of work is 12 vehicles or less. For surveying the centerline of a high-volume road, one lane shall be closed as shown in PATA 10a.
4. Road Work Ahead Signs (W20-11) may be used in place of the Survey Crew Signs (W21-6).
5. If the work is along the shoulder, the flagger and the W20-1A sign may be omitted.
6. A Be Prepared To Stop Sign (W3-4I) may be added to the sign series. When used, it should be located before the W20-1A Sign.
7. Channelizing devices may be omitted for cross-section survey.
8. Spacing of channelizing devices should not exceed a distance in feet equal to \( \frac{1}{2} D \) when used for the taper channelization and a distance in feet equal to D when used for tangent channelization.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD"
C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

CONDITION 2: For Urban Streets
A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

NOTES
1. All flaggers must be in communication with each other.
2. Each flagger should be clearly visible to traffic for a minimum distance of E.
3. At night, flagger stations shall be illuminated, except in emergencies.
4. For operations of 15 minutes or less:
   a. The W20-1 and W20-4 Signs are not required.
   b. All channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is present in advance of the work space.
   c. The W20-7A Sign may be eliminated if the flagger is clearly visible to traffic for a minimum distance of E.
5. 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.
6. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
NOTES
1. All flaggers must be in communication with each other.
2. Each flagger should be clearly visible to traffic for a minimum distance of E.
3. At night, flagger stations shall be illuminated, except in emergencies.
4. For operations of 15 minutes or less:
   a. The W20-1 Sign is not required.
   b. All channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is present in advance of the work space.
   c. The W20-7A Sign may be eliminated if the flagger is clearly visible to traffic for a minimum distance of E.
5. 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.
6. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
7. At signalized intersections, place signal in flashing operation. Contact local authorities for authorization.

Distance plaques on
Advance Warning signs shall be the same series type. Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
   A = 500 ft.
   B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD"
   C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

CONDITION 2: For Urban Streets
   A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

---

Distance Table

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<th>All Highways</th>
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<th>E</th>
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<td>ft</td>
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*Distances may be increased for downgrades or other conditions that affect stopping sight distance.
PUBLICATION 213
SHORT-TERM STATIONARY OPERATION
TWO-LANE, TWO-WAY ROADWAY - SINGLE FLAGGER

Distance plaques on Advance Warning signs shall be the same series type.
Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD"
C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

CONDITION 2: For Urban Streets
A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

NOTES:
1. This figure applies when all of the following conditions are satisfied:
a. Sight distance between the flagger and any vehicle between Points X and Y will be unobstructed.
b. The length of the one-lane section (not including any taper) is not greater than approximately 150 ft.
c. The ADT is not greater than approximately 1500, or the average 5-minute traffic volume during the
   period of work is 12 vehicles or less.
2. Flagger should be clearly visible to traffic for a minimum distance of E.
3. At night, flagger station shall be illuminated, except in emergencies.
4. For operations of 15 minutes or less:
a. The W20-1 and W20-4 Signs are not required.
b. All channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow
   light is present in advance of the work space.
c. The W20-7A Sign may be eliminated if the flagger is clearly visible to traffic for a minimum distance
   of E.
5. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting
   from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to
   eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad
   is essential.
Distance plaques on Advance Warning signs shall be the same series type. Example: either all XXX ft. or all "AHEAD."

**Condition 1:** All Highways (except Freeways and Expressways)
- A = 500 ft.
- B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD"
- C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"
- D = 2 times the normal speed limit

**Condition 2:** For Urban Streets
- A, B and C = 200 ft., and sign distance plaque to read "AHEAD"
- D = 2 times the normal speed limit

**Notes**
1. This figure applies when all of the following conditions are satisfied:
   a. Sight distance between the Stop Signs will be unobstructed.
   b. The length of the one-lane section (not including any taper) is not greater than approximately 250 ft.
   c. The ADT is not greater than approximately 1500, or the average 5-minute traffic volume during the period of work is 12 vehicles or less.
THE SAME SIGNING IS REQUIRED FOR THIS APPROACH

Distance plaques on Advance Warning signs shall be the same series type.

Example: Either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD"
C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"
D = 2 times the normal speed limit

CONDITION 2: For Urban Streets
A, B and C = 200 ft. and sign distance plaque to read "AHEAD"
D = 2 times the normal speed limit

NOTES
1. This figure applies when all of the following conditions are satisfied:
   a. Sight distance between X1 and X2, and between Y1 and Y2, will be unobstructed.
   b. The length of the one-lane section (not including any taper) is not greater than approximately 250 ft.
   c. The ADT is not greater than approximately 750, or the average 5-minute traffic volume during the period of work is 6 vehicles or less.
2. For operations 60 minutes or less in duration, a taper is not required if a vehicle with an activated flashing or revolving yellow light is located in the closed lane as shown. If a taper is not used, point X1 shall be approximately 150 ft from the rear of the vehicle with an activated flashing or revolving yellow light.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD".

**CONDITION 1:** All Highways (except Freeways and Expressways)
- A = 500 ft.
- B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD"
- C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

**CONDITION 2:** For Urban Streets
- A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

*Distances may be increased for downgrades or other conditions that affect stopping sight distance.*
Distance plaques on Advance Warning signs shall be the same series type.  
Example: either all XXX ft. or all "AHEAD."

**CONDITION 1:** All Highways (except Freeways and Expressways)

- A = 500 ft.
- B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD" 
- C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

**CONDITION 2:** For Urban Streets

- A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

**NOTES.**

1. The flagger and Automated Flagger Assistance Device (AFAD) should be clearly visible to traffic for a minimum distance of E.
2. At night, the flagger stations shall be illuminated, except in emergencies.
3. 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.
4. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
**Distance plaques on Advance Warning signs shall be the same series type.**

Example: either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways)
- A = 500 ft.
- B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD"
- C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

**CONDITION 2:** For Urban Streets
- A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

### NOTES
1. All flaggers must be in communication with each other.
2. Each Automated Flagger Assistance Device (AFAD) should be clearly visible to traffic for a minimum distance of E.
3. At night, the flagger stations shall be illuminated, except in emergencies.
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.
5. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
6. While operating the AFAD a flagger should position themselves beside the AFAD away from traffic so not to block an escape route.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways):  
A = 500 ft.  
B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD"  
C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

CONDITION 2: For Urban Streets  
A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

NOTES
1. Each Automated Flagger Assistance Device (AFAD) should be clearly visible to traffic for a minimum distance of E.
2. At night, the flagger stations shall be illuminated, except in emergencies.
3. 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.
4. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft., W20-1 sign distance plaque to read 500 ft. or "AHEAD"

CONDITION 2: For Urban Streets
A = 200 ft. and sign distance plaque to read "AHEAD"

NOTES

1. This figure applies for daylight operations that move intermittently or continuously at an average speed of less than 1 MPH (88 ft/min).
2. All flaggers must be in communication with each other.
3. Each flagger should be clearly visible to traffic for a minimum distance of E.
4. The distance between a flagger and the W20-10A Sign shall be a minimum of A and a maximum of 2 miles.
   a. A vehicle with an activated flashing or revolving yellow light is present.
   b. The operation will be 15 minutes or less in duration.
   c. Flagger should be clearly visible to traffic for a minimum distance of E or there is a Stop Sign on the
      approach to the flagger.
   d. The ADT entering the intersection is not greater than approximately 1500, or the average 5-minute traffic
      volume during the period of work is 12 vehicles or less.
5. Interim W3-4 or W20-10A Signs will be required for any projects over 2 miles in length. However, if there
   will be no flaggers after the W3-4 or W20-10A Sign, the W3-4 or W20-10A Sign should be removed or turned
   away from traffic.
   a. The signing for intersection roads is optional but when signed, a W20-10A Sign shall be installed on the
      roadway where work is taking place on each side of the intersecting road as indicated.
6. Additional flaggers may be required when working within or adjacent to an intersection.
7. For surface treatment operations W21-5-1 Signs should be installed. The first sign in each direction should
   be placed where the W20-1 Sign is shown and the W20-1 Sign moved "A" distance upstream.
8. A pilot vehicle is recommended for use with surface treatment operations on roads with ADTs of approximately
   1000 or more.
9. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from
   the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate
   conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
### Short-Term Mobile Operation

**Two-Lane, Two-Way Roadway - Single Flagger**

**Distance Plaques on Advance Warning Signs shall be the same series type.**

**Example:** either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways)
- \( A = 500 \text{ ft.} \)
- \( B = 500 \text{ ft.}, \) W20-4 sign distance plaque to read 1000 ft. or "AHEAD"
- \( C = 500 \text{ ft.}, \) W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

**CONDITION 2:** For Urban Streets
- \( A, B \) and \( C = 200 \text{ ft.} \) and sign distance plaque to read "AHEAD"

---

**Notes**

1. This figure applies for daylight operations when all of the following conditions are satisfied:
   - The operation moves intermittently or continuously at an average speed of less than 1 MPH (88 ft/min).
   - Sight distance between the flagger and any vehicle between Points X and Y will be unobstructed.
   - The length of the one-lane section is not greater than approximately 250'.
   - The ADT is not greater than approximately 1500, or the average 5-minute traffic volume during the period of work is 12 vehicles or less.

2. Flagger should be clearly visible to traffic for a minimum distance of \( E \).

3. For operations of 15 minutes or less:
   - a. The #20-1 and #20-4 Signs are not required.
   - b. The #20-7A Sign may be eliminated if the flagger is clearly visible to traffic for a minimum distance of \( E \).

4. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.

---

**Table: All Highways (except freeway and expressway)**

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<thead>
<tr>
<th>MPH</th>
<th>E (ft)</th>
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*Distances may be increased for downgrades or other conditions that affect stopping sight distance.*
**Distance plaques on Advance Warning signs shall be the same series type.**

**Example:** either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways)
- A = 500 ft., W20-2 sign distance plaque to read 500 ft. or "AHEAD"
- B = 500 ft., W20-3 sign distance plaque to read 1000 ft. or "AHEAD"

**CONDITION 2:** For Urban Streets
- A and B = 200 ft. and sign distance plaque to read "AHEAD"

**NOTES**

1. This figure applies for operations that move intermittently at an average speed of 1 MPH or less.
2. This setup is to be used during daylight hours only and only on roadways with ADT's of 1500 or less.
3. Hours of work should not interfere with rush hour traffic or school bus schedules and the work site must be capable of accommodating emergency vehicles with as little delay as possible.
4. Flaggers may be needed with the operations to control local traffic and at intersections. Flaggers must be in communication with each other.
5. The maximum distance between a flagger with the operation and a W3-4 Sign is 2 miles. Interim W3-4 Signs will be required for any project over 2 miles in length however, if there will be no flaggers between the W3-4 Sign and the R11-4 Sign, the W3-4 Sign should be removed or turned away from traffic.
6. The signing of intersecting roads with W21-2 Signs is required when the ADT of the intersecting road is 200 or greater.
7. Roads used as alternate routes should be owned and maintained by the Commonwealth (Department projects only).
8. At locations where there are overlapping detours or several detours within the same area, street names may be added to the G20-6 and G20-6-1 Signs, or signs with different colored arrows may be used to designate the different detour routes. The design and application of signs displaying colored arrows shall comply with Publication 236M.
9. The R11-3A (60" x 30") "ROAD CLOSED xx MILES AHEAD LOCAL TRAFFIC ONLY" Sign may be used in place of the R11-4 Sign.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft., W20-2 sign distance plaque to read 500 ft. or "AHEAD"
B = 500 ft., W20-3 sign distance plaque to read 1000 ft. or "AHEAD"

CONDITION 2: For Urban Streets
A and B = 200 ft. and sign distance plaque to read "AHEAD"

NOTES
1. This figure applies for stationary operations where it is not feasible to maintain alternate one direction traffic flow.
2. This setup is to be used during daylight hours only and only on roadways with ADT's of 1500 or less.
3. Hours of work should not interfere with rush hour traffic or school bus schedules and the work site must be capable of accommodating emergency vehicles with as little delay as possible.
4. Roads used as alternate routes should be owned and maintained by the Commonwealth (Department projects only).
5. At locations where there are overlapping detours or several detours within the same area, street names may be added to the G20-6 and G20-6-1 Signs, or signs with different colored arrows may be used to designate the different detour routes. The design and application of signs displaying colored arrows shall comply with 236M.
6. The R11-3A (60" x 30") "ROAD CLOSED xx MILES AHEAD LOCAL TRAFFIC ONLY" Sign may be used in place of the R11-4 Sign.
**PUBLICATION 213**

**SHORT-TERM STATIONARY OPERATION**

**TWO-LANE, TWO-WAY ROADWAY - ROAD CLOSURE**

**NOTES:**
Barricade Type I, II, III or Portable Sign Stand may be used for all signs.

1. **ROAD CLOSED**
   - **R11-2**
   - **48" x 30"**

2. **ROAD CLOSED**
   - **R11-2**
   - **48" x 30"**

3. **DETOUR**
   - **M4-10L**
   - **36" x 12"**

4. **DETOUR**
   - **M4-10R**
   - **36" x 12"**

5. **ROAD CLOSED**
   - **#20-2**

6. **DETOUR**
   - **M4-9SL**
   - **30" x 24"**

7. **DETOUR**
   - **M4-9SR**
   - **30" x 24"**

8. **DETOUR**
   - **M4-9L**
   - **30" x 24"**

9. **DETOUR**
   - **M4-9R**
   - **30" x 24"**

10. **DETOUR**
    - **M4-8A**
    - **24" x 18"**

**Example: either all XXX ft. or all "AHEAD"**

**CONDITION 1:** All Highways (except Freeways and Expressways)
- A = 500 ft., #5, #6, and #7 sign distance plaque to read 500 ft. or "AHEAD"
- B = 500 ft., #3 and #4 sign distance plaque to read 1000 ft. or "AHEAD"
- C = 500 ft., #11 sign distance plaque to read 1500 ft. or "AHEAD"

**CONDITION 2:** For Urban Streets
- A, B and C = 200 ft. and all sign distance plaques to read "AHEAD"

**NOTES**

1. This figure applies for stationary operations where it is not feasible to maintain alternate one direction traffic flow.
2. This setup is to be used during daylight hours only and only on roadways with ADT’s of 1500 or less.
3. Hours of work should not interfere with rush hour traffic or school bus schedules and the work site must be capable of accommodating emergency vehicles with as little delay as possible.
4. Roads used as alternate routes should be owned and maintained by the Commonwealth (Department projects only).
5. At locations where there are overlapping detours or several detours within the same area, street names may be added to the M4-9 series signs, or signs with different colored arrows may be used to designate the different detour routes. The design and application of signs displaying colored arrows shall comply with 236M.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W20-4 sign distance plaque to read 1000 ft. or "AHEAD"
C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"
D = 2 times the normal speed limit

CONDITION 2: For Urban Streets
A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

NOTES
1. This figure applies for operations that move intermittently or continuously at an average speed of less than 1 MPH (88 ft/min).
2. All flaggers must be in communication with each other.
3. Each flagger should be clearly visible to traffic for a minimum distance of E.
4. At night, flagger stations shall be illuminated, except in emergencies.
5. For operations of 15 minutes or less:
   a. The W20-1 and W20-4 Signs are not required.
   b. The W20-7A Sign may be eliminated if the flagger is clearly visible to traffic for a minimum distance of E.
6. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
CONDITION 1: All Highways (except Freeways and Expressways)
A = 10 times the normal speed limit.

CONDITION 2: For Urban Streets
A = 200 ft.

NOTES
1. This figure applies for operations that move intermittently or continuously at an average speed of 1 MPH or more.
2. The shadow vehicle shall be positioned so that it is visible from behind for a minimum distance of A. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.
3. Where passing is not permitted for extended lengths, the shadow and work vehicles should pull over periodically, when it is reasonable and safe, in order to allow "backed-up" or queued traffic to resume its normal speed.
4. Other appropriate standard signs may be used instead of the W20-1 Sign.
5. The shadow vehicle should be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.
6. A truck-mounted attenuator may be used on the shadow vehicle and/or on the work vehicle.
7. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
\[ A = 500 \text{ ft.} \]
\[ B = 500 \text{ ft., W20-1 sign distance plaque to read 1000 ft. or "AHEAD"} \]

CONDITION 2: For Urban Streets
\[ A \text{ and } B = 200 \text{ ft. and sign distance plaque to read "AHEAD"} \]

NOTES
1. 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 shifting taper.
2. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
3. If the length of the tangent section between beginning and ending tapers is more than 600 ft, use two W1-4 Signs as shown. If the distance is 600 ft or less, use a W20-1 Sign.
4. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
**Distance plaques on Advance Warning signs shall be the same series type.**

**Example: either all XXX ft. or all "AHEAD"**

**CONDITION 1:** All Highways (except Freeways and Expressways)
- A = 500 ft.
- B = 500 ft., W20-4 and W20-5R sign distance plaque to read 1000 ft. or "AHEAD"
- C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

**CONDITION 2:** For Urban Streets
- A = 200 ft. and sign distance plaque to read "AHEAD"

**NOTES**
1. All flaggers must be in communication with each other.
2. Each flagger should be clearly visible to traffic for a minimum distance of E.
3. At night, flagger stations shall be illuminated, except in emergencies.
4. For operations of 15 minutes or less:
   a. The W20-1 and W20-4 Signs are not required.
   b. All channelizing devices may be eliminated if two vehicles with an activated flashing or revolving yellow light are present in advance of the work space.
   c. The W20-7A Sign may be eliminated if the flagger is clearly visible to traffic for a minimum distance of E.
5. 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.
6. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
7. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways except Freeways and Expressways
A = 500 ft.
B = 500 ft., W20-4 and W20-5L sign distance plaque to read 1000 ft. or "AHEAD"
C = 500 ft., W20-1 sign distance plaque to read 1500 ft. or "AHEAD"

CONDITION 2: For Urban Streets
A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

NOTES
1. All flaggers must be in communication with each other.
2. Each flagger should be clearly visible to traffic for a minimum distance of E.
3. At night, flagger stations shall be illuminated, except in emergencies.
4. For operations of 15 minutes or less:
   a. The W20-1 and W20-4 Signs are not required.
   b. All channelizing devices may be eliminated if two vehicles with an activated flashing or revolving yellow light is present in advance of the work space.
   c. The W20-7A Sign may be eliminated if the flagger is clearly visible to traffic for a minimum distance of E.
5. 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.
6. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
7. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD."

**CONDITION 1:** All Highways (except Freeways and Expressways)
- A = 500 ft.
- B = 500 ft., W20-1 sign distance plaque to read 1000 ft. or "AHEAD"

**CONDITION 2:** For Urban Streets
- A and B = 200 ft. and sign distance plaque to read "AHEAD"

**NOTES**

1. 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 shifting taper.
2. For operations of 15 minutes or less:
   a. The W20-1, W3-3, W1-4L, and W1-4R Signs are not required.
   b. All channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is present in advance of the work space.
3. When a highway-grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
4. If the length of the tangent section between beginning and ending tapers is more than 600 ft, use two W1-4 Signs as shown. If the distance is 600 ft or less, use a W24-1 Sign.
5. Where speed or volume is higher, signs such as additional Left Lane Closed XX ft Sign (W20-5L) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
Distance plaques on Advance Warning signs shall be the same series type.  
Example: either all XXX ft. or all "AHEAD".

CONDITION 1: All Highways (except Freeways and Expressways)  
A = 500 ft., W9-3 sign distance plaque to read 500 ft. or "AHEAD"  
B = 500 ft., W20-1 sign distance plaque to read 1000 ft. or "AHEAD"  
D = 2 times the normal speed limit

CONDITION 2: For Urban Streets  
A and B = 200 ft. and sign distance plaque to read "AHEAD"  
D = 2 times the normal speed limit

NOTES

1. For stationary operations 60 minutes or less, or for mobile operations that move intermittently or continuously at an average speed of 1 MPH or less, a taper is not required if a vehicle with an activated flashing or revolving yellow light is located in advance of the work space.

2. For operations of 15 minutes or less:  
a. The W20-1 and W9-3 Signs are not required.  
b. All channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is present in advance of the work space.

3. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.

4. Where speed or volume is higher, signing such as additional Center Lane Closed XX ft Sign (W9-3) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W20-1 sign distance plaque to read 1000 ft. or "AHEAD"

CONDITION 2: For Urban Streets
A and B = 200 ft., and sign distance plaque to read "AHEAD"

NOTES

1. For right lane closures, signs in the opposite direction of travel are not required.
2. For operations 15 minutes or less:
   a. The W20-1, W9-3 and W1-4R Signs are not required.
   b. All channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is present in advance of the work zone.
3. For stationary operations 60 minutes or less in duration, or for mobile operations that move intermittently or continuously at an average speed of 1 MPH or less,
   a. The W20-1 Sign in the opposite direction of travel is not required.
4. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
5. Where speed or volume is higher, signage such as additional Left Lane Closed XX ft. Sign (W20-5L) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
6. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
7. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on expressways and optional on all other highways.
**See General Notes, Tables, and Legend
Drawing for Taper Length (L).**

**Distance plaques on Advance Warning signs shall be the same series type.**

**Example:** either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways)
- \( A = 500 \text{ ft} \)
- \( B = 500 \text{ ft} \), W20-5R sign distance plaque to read 1000 ft. or "AHEAD"
- \( C = 500 \text{ ft} \), W20-1 sign distance plaque to read "AHEAD"

**CONDITION 2:** For Urban Streets
- \( A, B \text{ and } C = 200 \text{ ft} \), and sign distance plaque to read "AHEAD"

**CONDITION 3:** For Expressways Highways
- \( A = 1000 \text{ ft} \)
- \( B = 1600 \text{ ft} \), W20-5R and W20-5L sign distance plaque to read \( \frac{1}{2} \) MILE or "AHEAD"
- \( C = 2640 \text{ ft} \), W20-1 sign distance plaque to read 1 MILE or "AHEAD"

**NOTES**

1. 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.
2. When a highway-rail grade crossing exists within the work zone, or if it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a foiler at the crossing. Coordination with the railroa is essential.
3. If the length of the tangent section between beginning and ending tapers is more than 600 ft, use two W1-4 Signs as shown. If the distance is 600 ft or less, use a W24-1 Sign.
4. Where speed or volume is higher, signing such as additional Left Lane Closed XX ft. Sign (W20-5L), Right Lane Closed XX ft. Sign (W20-5R) or Be Prepared To Stop Sign (W3-4L) should be used in advance of the W20-1 sign.
5. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
6. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on expressways and optional on all other highways.

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*Distances may be increased for downgrades or other conditions that affect stopping sight distance.*
**See General Notes, Tables, and Legend Drawing for Taper Length (L).**

Required on Freeways and Expressways but Optional for All Other Highways, see Note 6.

Taper (Optional)

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**Distance plaques on Advance Warning signs shall be the same series type.**

Example either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways)

A = 500 ft.
B = 500 ft., W20-5R sign distance plaque to read 1000 ft., or "AHEAD"
C = 500 ft., W20-1 sign distance plaque to read 1500 ft., or "AHEAD"

**CONDITION 2:** For Urban Streets

A, B and C = 200 ft. and sign distance plaque to read "AHEAD"

**CONDITION 3:** For Freeway and Expressway Highways

A = 1000 ft.
B = 1600 ft., W20-5R sign distance plaque to read ½ MILE or "AHEAD"
C = 2600 ft., W20-1 sign distance plaque to read 1 MILE or "AHEAD"

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**NOTES**

1. 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.
2. For left lane closures, the W20-5L Sign shall be used instead of the W20-5R Sign.
3. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
4. Where speed or volume is higher, signing such as additional Right Lane Closed XX ft Sign (W20-5R) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
5. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
6. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways and Freeways. Use of a TMA is optional on all other Highways when a shadow vehicle is used.
PUBLICATION 213
SHORT-TERM STATIONARY OPERATION
THREE-LANE, ONE-WAY ROADWAY - WORK AREA IN THE CENTER LANE

Required on Freeways and Expressways but Optional for All Other Highways. (See Note 6)

DISTANCE PLAQUES ON ADVANCE WARNING SIGNS SHALL BE OF THE SAME SERIES TYPE.

Example: Either all XXX ft., or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 1000 ft.
C = 1140 ft.
D = 2 times the normal speed limit.
F = ½ Mile, W20-1 sign distance plaque to read 1 Mile or "AHEAD".
(If second W20-5L is eliminated, F will be 1140 ft., and the W20-1 sign distance plaque to read ½ Mile or "AHEAD".)

CONDITION 2: For Urban Streets
A, B, and F = 200 ft., and sign distance plaque to read "AHEAD".
(Distance C and the second W20-5L sign may be eliminated)
D = 2 times the normal speed limit.

CONDITION 3: For Freeway and Expressway Highways
A = 1000 ft.
B = 1640 ft., W20-5L sign distance plaque to read ½ MILE or "AHEAD".
C = 2640 ft., W20-1 sign distance plaque to read 1 MILE or "AHEAD".
D = 2 times the normal speed limit.

NOTES
1. 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.
2. A reversed pattern, beginning with a right lane closure, may also be used.
3. If a paved shoulder having a minimum width of 10 ft. and sufficient strength is available, the left and center lanes may be closed and motor vehicle traffic carried around the work space on the right lane and a right shoulder. When a shoulder lane is used that cannot adequately accommodate trucks, trucks may be directed to use the normal travel lanes.
4. Where speed or volume is higher, signing such as additional Left Lane Closed XX ft. Sign (W20-5L) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
5. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
6. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways and Freeways. Use of a TMA is optional on all other Highways when a shadow vehicle is used.

PATA 19
Short-Term Stationary Operation
Divided or One-Way Highway - Work Area in Two Adjacent Lanes

Required for Freeways and Expressways, Optional for all other Highways, see note 6.

1/2 D Max. (typ. for all tapers)

Taper (Optional)

W20-5AR
48" x 48"

W4-2R

D Max.

Shoulder

(See Note 5)

(See Note 5)

1/3 L Min. (See Note 1)

See General Notes, Tables, and Legend Drawing for Taper Length (L).

***Speeds less than 45 MPH (Optional)

100' Min. 250' Max.

200' to Max. 500'

(End Road Work)

G20-2
60" x 24"

Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)

A = 500 ft.
B = 1000 ft., W20-5AR sign distance plaque to read 1500 ft. or "AHEAD"
C = 1140 ft., W20-5AR sign distance plaque to read 1/2 MILE or "AHEAD"
(Distance C and the second W20-5AR sign may be eliminated if speeds are less than 45 MPH)

F = 2640 ft., W20-1 sign distance plaque to read 1 MILE or "AHEAD"

If sign is eliminated, F will be 1140 ft., and the W20-1 sign distance plaque to read 1/2 MILE or "AHEAD"

CONDITION 2: For Urban Streets

A, B, C and F = 200 ft. and sign distance plaque to read "AHEAD"

(Distance C and the second W20-5AR sign may be eliminated)

CONDITION 3: For Freeway and Expressway Highways

A = 1000 ft.
B = 1640 ft., W20-5AR sign distance plaque to read 1/2 MILE or "AHEAD"
C = 2640 ft., W20-5AR sign distance plaque to read 1 MILE or "AHEAD"

F = 1 MILE, W20-1 sign distance plaque to read 2 MILES or "AHEAD"

PATA 20

Sheet 1 of 2 (See Sheet 2 of 2 for Notes)
NOTES

1. 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.

2. If the two left lanes are closed, the Left Two Lanes Closed Ahead Sign (W20-5AH) shall be used instead of the W20-5AR Sign.

3. Where speed or volume is higher, signing such as additional Right Two Lanes Closed XX ft Sign (W20-5AR) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.

4. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.

5. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.

6. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways and Freeways. Use of a TMA is Optional on all other Highways when a shadow vehicle is used.
Distance plaques on Advance Warning signs shall be the same series type. Example: either all XXX ft. or all "AHEAD".

A = 1000 ft.
B = 1640 ft., W20-5R sign distance plaque to read ½ MILE or "AHEAD"
C = 2640 ft., W20-1 sign distance plaque to read 1 MILE or "AHEAD"
D = 2 times the normal speed limit.

NOTES
1. In locations with heavy ramp traffic, the channelizing devices in advance of the ramp may be eliminated if special advance signing is erected to indicate that the right lane is a mandatory exit only lane.
2. The temporary EXIT sign shall be located in the temporary gore. It shall be mounted a minimum of 3 feet from the pavement surface to the bottom of the sign.
3. 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.
4. When the exit ramp is closed, a black or orange EXIT CLOSED panel should be placed diagonally across the interchange/intersection guide signs.
5. See P&TA GENERAL, Table 5 for size of the Flashing Arrow Panel.
6. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA).
7. Where speed or volume is higher, signage such as additional Right Lane Closed XX ft Sign (W20-5R) or Be Prepared To Stop Sign (W3-41) should be used in advance of the W20-1 sign.
Optional if an existing W4-1R sign is within 500 ft. that is not blocked by short term signing.

Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

A = 1000 ft.,
B = 1640 ft., W20-5R sign distance plaque to read ½ MILE or "AHEAD"
C = 2640 ft., W20-1 sign distance plaque to read 1 MILE or "AHEAD"
D = 2 times the normal speed limit.

NOTES
1. An acceleration lane of sufficient length should be provided whenever possible.
2. Where inadequate acceleration distance exists for the temporary entrance, the Yield (R1-2) and Yield Ahead (W3-2) Signs shall be replaced with Stop (R1-T) and Stop Ahead (W3-1) Signs.
3. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
4. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA).
5. Where speed or volume is higher, signage such as additional Right Lane Closed XX ft Sign (W20-5R) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
CONDITION 1: All Highways (except Freeways and Expressways)
A Min. = 500 ft.

CONDITION 2: For Urban Streets
A Min. = 200 ft.

CONDITION 3: For Freeway and Expressway Highways
A Min. = 1000 ft.

NOTES
1. This figure applies for operations that move intermittently or continuously at an average speed of more than 1 MPH.
2. When the work vehicle occupies the far left lane or an interior lane, the appropriate lane closure sign should be used in place of the W20-5R sign on Shadow Vehicle 2. The lane closure sign on Shadow Vehicle 2 should be placed so as not to obscure the arrow panel.
3. When the work vehicle occupies an interior lane (a lane other than the far right or far left) of a directional roadway with a right shoulder 10 ft. or more in width, Shadow Vehicle 2 should drive in the right shoulder with a sign indicating that work is taking place in the interior lane.
4. 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.
5. 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 but not to be used to close a lane.
6. Work should normally be accomplished during off-peak hours.
7. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
8. All shadow vehicles shall be equipped with Truck Mounted Attenuator (TMA).
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways):
A = 500 ft., W20-1 sign distance plaque to read 500 ft. or "AHEAD"
D = 2 times the normal speed limit.

**CONDITION 2:** For Urban Streets:
A = 200 ft. and sign distance plaque to read "AHEAD"
D = 2 times the normal speed limit

**CONDITION 3:** For Freeway and Expressway Highways:
A = 1000 ft., W20-1 sign distance plaque to read 1000 ft. or "AHEAD"
D = 2 times the normal speed limit

**NOTES**

1. Traffic control devices are not required if the work space is outside the highway right-of-way, behind barrier, more than 2 ft behind curb, or 15 ft or more from the edge of any roadway.

2. For divided highways and one-way highways where it is physically possible, advance warning signs should also be placed on the left-hand side of the roadway.
NOTES

1. For divided highways and one-way highways where it is physically possible, advance warning signs should also be placed on the left-hand side of the roadway.

2. The W21-5 Sign may be replaced with other appropriate signs (Low Shoulder Sign, No Guard Rail Sign, and so forth).

3. The W21-5 Sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign prior to the work space.

4. A W21-5BL or W21-5BR Sign should be used on limited-access highways where there is no opportunity for disabled vehicles to pull off the roadway.

5. 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.

6. Based on engineering judgement, a temporary barrier with proper delineation and end treatment may be used instead of longitudinal channelizing devices. The channelized taper is still required.
### Distance Plaques on Advance Warning Signs

Distance plaques on Advance Warning signs shall be the same series type. Example: either all XXX ft. or all "AHEAD"

##### Condition 1:
- All Highways except Freeways and Expressways:
  - \( A = 500 \text{ ft.} \)
  - \( B = 500 \text{ ft.}, W20-4 \text{ sign distance plaque to read 1000 ft.} \)
  - \( C = 500 \text{ ft.}, W3-4 \text{ sign distance plaque to read 1500 ft.} \)
  - \( F = 500 \text{ ft.}, W20-1 \text{ sign distance plaque to read 1/2 MILE.} \)

##### Condition 2:
For Urban Streets
- \( A, B, C \) and \( F = 200 \text{ ft.} \) and sign distance plaque to read "AHEAD"

### Notes
1. All flaggers must be in communication with each other.
2. Each flagger should be clearly visible to traffic for a minimum distance of \( E \).
3. At night, flagger stations shall be illuminated, except in emergencies.
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.
5. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
Long-Term Stationary Operation
Two-Lane, Two-Way Roadway - Single Flagger

The same signing is required for this approach.

Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

**Additional signs may be used based on engineering judgement.**

<table>
<thead>
<tr>
<th>All Highways (except freeway and expressway)</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
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<td>360</td>
</tr>
</tbody>
</table>

For speeds greater than 45 MPH, use Figure PATA 26a.

*Distances may be increased for downgrades or other conditions that affect stopping sight distance.

**NOTES**

1. This figure applies when all of the following conditions are satisfied:
   a. Sight distance between the flagger and any vehicle between Points X and Y will be unobstructed.
   b. The length of the one-lane section (not including any taper) is not greater than approximately 150 ft.
   c. The ADT is not greater than approximately 1500, or the average 5-minute traffic volume during the period of work is 12 vehicles or less.
2. Flagger should be clearly visible to traffic for a minimum distance of E.
3. At night, flagger station shall be illuminated, except in emergencies.
4. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
LONG-TERM STATIONARY OPERATION
TWO-LANE, TWO-WAY ROADWAY - STOP SIGN-CONTROLLED LANE CLOSURE

Distance plaques on Advance Warning signs shall be the same series type. Example: either all XXX ft. or all "AHEAD."

CONDITION 1: All Highways (except Freeways and Expressways): A = 500 ft., B = 500 ft. and W20-4 sign distance plaque to read 1000 ft., C = 500 ft. and W20-1 sign distance plaque to read 1500 ft., D = 2 times the normal speed limit.

CONDITION 2: For Urban Streets: A, B, and C = 200 ft. and sign distance plaque to read "AHEAD," D = 2 times the normal speed limit.

NOTES
1. This figure applies when all of the following conditions are satisfied:
   a. Sight distance between the Stop Signs will be unobstructed.
   b. The length of the one-lane section (not including any taper) is not greater than approximately 150 ft.
   c. The ADT is not greater than approximately 1500.
2. The length of the one-lane section and/or ADT may be increased if a study indicates that a satisfactory level of service can be maintained.
3. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W20-4 sign distance plaque to read 1000 ft.
C = 500 ft., W20-1 sign distance plaque to read 1500 ft.
D = 2 times the normal speed limit.

CONDITION 2: For Urban Streets
A, B, and C = 200 ft. and sign distance plaque to read "AHEAD"
D = 2 times the normal speed limit.

NOTES
1. This figure applies when all of the following conditions are satisfied:
   a. Sight distance between \( X_1 \) and \( X_2 \), and between \( Y_1 \) and \( Y_2 \), will be unobstructed.
   b. The length of the one-lane section (not including any taper) is not greater than approximately 150 ft.
   c. The ADT is not greater than approximately 750.

2. The length of the one-lane section and/or ADT may be increased if a study indicates that a satisfactory level of service can be maintained.

3. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
LONG-TERM STATIONARY OPERATION
TWO-LANE, TWO-WAY ROADWAY - TEMPORARY TRAFFIC CONTROL SIGNALS

Distance plaques on Advance Warning signs shall be the same series type.
Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W20-4 sign distance plaque to read 1000 ft.
C = 500 ft., W20-1 sign distance plaque to read 1500 ft.
D = 2 times the normal speed limit

CONDITION 2: For Urban Streets
A, B and C = 200 ft. and sign distance plaque to read "AHEAD"
D = 2 times the normal speed limit

NOTES
1. The design and application of the temporary traffic control signals shall comply with the most current version of Publications 212, 213, and 143M.
2. Remove conflicting pavement markings.
3. Stop bars shall be installed with temporary traffic control signals. Existing conflicting pavement markings and raised pavement markers between stop bars shall be removed. After temporary traffic control signals are removed, the stop bars shall be removed and the permanent pavement markings restored.
4. When the temporary traffic control signal is changed to flashing mode, either manually or automatically, red signal indications shall be flashed to both approaches.
5. Refer to Appendix A of this publication for additional notes and permit information pertaining to temporary traffic control signals.
LONG-TERM STATIONARY OPERATION
TWO-LANE, TWO-WAY ROADWAY - PORTABLE TRAFFIC CONTROL SIGNALS

Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W20-4 sign distance plaque to read 1000 ft.
C = 500 ft., W20-1 sign distance plaque to read 1500 ft.
D = 2 times the normal speed limit

CONDITION 2: For Urban Streets
A, B and C = 200 ft., and sign distance plaque to read "AHEAD"
D = 2 times the normal speed limit

NOTES
1. The use of portable traffic control signals in Pennsylvania for long-term operations shall comply with the provisions of this figure.
2. Refer to Appendix A of this publication for additional notes and permit information pertaining to portable traffic control signals.
3. The design and application of the portable traffic control signals shall comply with the most current version of Publications 212, 213, and 149W.
4. Remove conflicting pavement markings.
5. Stop bars shall be installed with portable traffic control signals for long-term operations. Existing conflicting pavement markings and raised pavement markers between stop bars shall be removed. After portable traffic control signals are removed, the stop bars shall be removed and the permanent pavement markings restored.
Distance plaques on Advance Warning signs shall be the same series type.

**Example:** either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways)

A = 500 ft.
B = 500 ft., W20-4 sign distance plaque to read 1000 ft.
C = 500 ft., W20-1 sign distance plaque to read 1500 ft.
D = 2 times the normal speed limit

**CONDITION 2:** For Urban Streets

A, B and C = 200 ft. and sign distance plaque to read "AHEAD"
D = 2 times the normal speed limit

**NOTES**

1. The use of portable traffic control signals in Pennsylvania for short-term operations shall comply with the provisions of this figure.
2. Refer to Appendix A of this publication for additional notes and permit information pertaining to portable traffic control signals.
3. The design and application of the portable traffic control signals shall comply with the most current version of Publications 212, 213, and 149M.
Example: either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways)
- \( A = 500 \text{ ft.} \)
- \( B = 1000 \text{ ft.}, W5-5 \text{ sign distance plaque to read 1500 ft.} \)
- \( C = 1640 \text{ ft.}, W20-1 \text{ sign distance plaque to read } \frac{1}{2} \text{ Mile} \)

**CONDITION 2:** For Urban Streets
- \( A, B \) and \( C = 200 \text{ ft.} \) and sign distance plaque to read "AHEAD"

**NOTES**
1. Remove conflicting pavement markings.
2. All temporary barriers and end treatments shall be crashworthy.
3. A no passing zone shall be established when an existing no passing zone is not present.
4. If the tangent distance along the temporary diversion is more than 600 ft., an appropriate Reverse Curve Sign (W1-4L or W1-4R) should be used in place of the W24-1L or W24-1R, and a second Reverse Curve Sign (opposite of the first) should be used in advance of the second reverse curve back to the original alignment.
5. 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 (W1-3L or W1-3R) should be used in lieu of the Reverse Curve Signs (W1-4L or W1-4R) respectively.
6. 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.
7. Delineators should be placed along the temporary roadway where needed.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft, or all "AHEAD."

**CONDITION 1:** All Highways (except freeways and expressways):
- A = 500 ft., W1-4L and W4-2L
- B = 500 ft., W5-5 and W20-5L sign distance plaque to read 1000 ft.
- C = 500 ft., W20-1 sign distance plaque to read 1500 ft.

**CONDITION 2:** For Urban Streets
- A, B and C = 200 ft. and sign distance plaque to read "AHEAD."

**NOTES**
1. Remove conflicting pavement markings.
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 shifting taper.
3. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
4. Where speed or volume is higher, signing such as additional Left Lane Closed XX ft Sign (W20-5L) or Be Prepared To Stop Sign (W3-4L) should be used in advance of the W20-1 sign.
5. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be $\frac{1}{2}$ D Max.
6. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
LONG-TERM STATIONARY OPERATION - THREE-LANE, TWO-WAY ROADWAY WITH CENTER LANE, LEFT TURN ONLY PATTERN WORK AREA IN ONE OF THE THROUGH LANES

Install temporary double yellow line, see note 5.

** ½ L Min.

** See General Notes, Tables, and Legend Drawing for Taper Length (L).

Distance plaques on Advance Warning signs shall be the same series type.

**Example: either all XXX ft. or all "AHEAD"**

| Condition 1: All Highways (except freeways and expressways): |
|-------------|---|---|---|
| A ≤ 500 ft., W9-3 sign distance plaque to read 500 ft. |
| B = 500 ft., W20-1 and W5-5 sign distance plaque to read 1000 ft. |
| C = 500 ft., W20-1 sign distance plaque to read 1500 ft. |

| Condition 2: For Urban Streets |
| A, B and C = 200 ft. and sign distance plaque to read "AHEAD" |

**Notes**

1. Remove conflicting pavement markings.
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 shifting taper.
3. When a highway-rail grade crossing exists within the work zone, or if it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
4. Where speed or volume is higher, signing such as additional Center Lane Closed XX ft Sign (W9-3) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
5. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be ½ D Max.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft., W9-3 sign distance plaque to read 500 ft.
B = 500 ft., W20-1 sign distance plaque to read 1000 ft.
D = 2 times the normal speed limit

CONDITION 2: For Urban Streets
A and B = 200 ft. and sign distance plaque to read "AHEAD"
D = 2 times the normal speed limit

NOTES
1. Remove conflicting pavement markings.
2. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.
3. Where speed or volume is higher, signing such as additional Center Lane Closed XX ft Sign (W9-3) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
4. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be \( \frac{1}{2} D \) Max.
** Required on Expressways when workers are present, but Optional for All Other Highways, see Note 7.
*** Speeds less than 45 MPH (Optional)

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**DISTANCE PLAQUES ON ADVANCE WARNING SIGNS SHALL BE THE SAME SERIES TYPE.

Example: either all XXX ft., or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 500 ft., W20-5L sign distance plaque to read 1000 ft.
C = 500 ft., W20-5L sign distance plaque to read 1500 ft.

(Distance C and the second W20-5L sign may be eliminated if speeds are less than 45 MPH)

F = 1140 ft. or (1640 ft. if second W20-5L sign is eliminated, W20-1 sign distance plaque to read 1/2 MILE)

CONDITION 2: For Urban Streets
A, B and F = 200 ft. and sign distance plaque to read "AHEAD"
(Distance C and the second W20-5L sign may be eliminated)

CONDITION 3: For Freeway and Expressway Highways
A = 1000 ft.
B = 1640 ft., W20-5L sign distance plaque to read 1/2 MILE
C = 2640 ft., W20-5L sign distance plaque to read 1 MILE
F = 5280 ft., W20-1 sign distance plaque to read 2 MILES

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** DISTANCES MAY BE INCREASED FOR DOWNGRADS OR OTHER CONDITIONS THAT AFFECT STOPPING SIGHT DISTANCE.
NOTES

1. Remove conflicting pavement markings.

2. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flogger at the crossing. Coordination with the railroad is essential.

3. Where speed or volume is higher, signing such as additional Left Lane Closed XX ft Sign (#20-5L) or Be Prepared To Stop Sign (#3-4) should be used in advance of the #20-1 sign.

4. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be 1/2 D Max.

5. For right lane closures, signing is not required for the opposite approach. Right Lane Closed Signs (#20-5R) shall be used instead of the Left Lane Closed Signs (#20-5L), and Pavement Width Transition - Right Lane Ends Signs (#4-2R) shall be used instead of Pavement Width Transition - Left Lane Ends Signs (#4-2L).

6. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.

7. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways. Use of a TMA is optional on all other highways when a shadow vehicle is used.
Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

**CONDITION 1:** All Highways (except Freeways and Expressways):

A = 500 ft.
B = 1000 ft., W20-5R/W20-5L sign distance plaque to read 1500 ft.
C = 1140 ft., W20-5R/W20-5L sign distance plaque to read ½ Mile (Distance C and the second W20-5R sign may be eliminated if speeds are less than 45 MPH)

F = ½ Mile, W20-1 sign distance plaque to read 1 Mile or ½ Mile. 
   (If second W20-5L is eliminated, F will be 1140 ft., and the W20-1 sign distance plaque to read ½ Mile.)

**CONDITION 2:** For Urban Streets

A, B, and F = 200 ft. and sign distance plaque to read "AHEAD" (Distance C and the second W20-5R sign may be eliminated)

**CONDITION 3:** For Expressway Highways

A = 1000 ft.
B = 1640 ft., W20-5R/W20-5L sign distance plaque to read ½ MILE
C = 2640 ft., W20-5R/W20-5L sign distance plaque to read 1 MILE
F = 1 MILE, W20-1 sign distance plaque to read 2 Miles.

<table>
<thead>
<tr>
<th>MPH</th>
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<th>E</th>
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<td>495</td>
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* Distances may be increased for downgrades or other conditions that affect stopping sight distance.
NOTES

1. Remove conflicting pavement markings.

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 shifting taper (see PATA 1).

3. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.

4. The maximum length of temporary one-lane operations, excluding transitions, should not exceed approximately 3 miles. Temporary one-lane operations longer than approximately 3 miles shall only be permitted if justified by an engineering analysis of crossover locations, traffic operations, safety, and other related factors.

5. The alignment of the crossover may be designed as a reverse curve. When the crossover follows a curved alignment, the design criteria contained in Publication 13M (Design Manual Part 2-Highway Design) should be used.

6. For existing concrete pavements, temporary bituminous overlays should be used as shown to cover misleading pavement joints.

7. Signing for this approach shall follow the same configuration as the other direction, using the W20-5L and W4-2L Signs In place of the W20-5R and W4-2R Signs respectively.

8. Where speed or volume is higher, signage such as additional Right Lane Closed XX ft. Sign (W20-5R), Left Lane Closed XX ft. Sign (W20-5L) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.

9. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be $\frac{1}{2} D_{\text{Max}}$.

10. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways. Use of a TMA is optional on All Other Highways when a shadow vehicle is used.
PUBLICATION 213
LONG-TERM STATIONARY OPERATION
DIVIDED OR ONE-WAY HIGHWAY - WORK AREA IN THE LEFT OR RIGHT LANE

Required for Freeways and Expressways when workers are present, but optional for all other Highways, see Note 8.

Install temporary white edge line, see note 6.

\[ \text{typ. for all tapers!} \]

\[ \frac{1}{2} D \text{ Max.} \]

\[ D \text{ Max.} \]

\[ 100' \text{ to } 250' \]

\[ \text{Max.} \]

\[ \frac{1}{3} L \text{ Min.} \]

\[ \text{** See General Notes, Tables, and Legend Drawing for Taper Length (L).} \]

\[ \text{***Speeds less than 45 MPH (Optional)} \]

\[ \text{END ROAD WORK} \]

\[ 60'' \times 24'' \]

Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

\[ \text{CONDITION 1: All Highways (except Freeways and Expressways):} \]

\[ A = 500 \text{ ft.} \]

\[ B = 1000 \text{ ft.}, \ W20-5R sign distance plaque to read 1500 ft. \]

\[ C = 1140 \text{ ft.}, \ W20-5R sign distance plaque to read } \frac{1}{2} \text{ MILE} \]

\[ \text{(Distance C and the second W20-5R sign may be eliminated if speeds are less than 45 MPH)} \]

\[ F = \frac{1}{2} \text{ MILE}, \ W20-1 sign distance plaque to read 1 MILE or (if second W20-5R is eliminated,} \]

\[ \text{F will be } 1140 \text{ ft., and the W20-1 sign distance plaque to read } \frac{1}{2} \text{ MILE)} \]

\[ \text{CONDITION 2: For Urban Streets} \]

\[ A, B \text{ and } F = 200 \text{ ft. and sign distance plaque to read } \text{"AHEAD"} \]

\[ \text{(Distance C and the second W20-5R sign may be eliminated)} \]

\[ \text{CONDITION 3: For Freeway and Expressway Highways} \]

\[ A = 1000 \text{ ft.} \]

\[ B = 1640 \text{ ft.}, \ W20-5R sign distance plaque to read } \frac{1}{2} \text{ MILE} \]

\[ C = 2640 \text{ ft.}, \ W20-5R sign distance plaque to read 1 MILE \]

\[ F = 1 \text{ MILE, W20-1 sign distance plaque to read } 2 \text{ MILES} \]

\[ \text{Table: D and E distances for different speeds and highways} \]

\[ \begin{array}{|c|c|c|}
\hline
\text{All Highways (except Freeways and Expressways)} & \text{D (ft)} & \text{E (ft)} \\
\hline
\text{MPH} & 25 & 30 & 35 & 40 & 45 & 50 & 55 & 60 & 65 \\
\hline
D & 50 & 60 & 70 & 80 & 90 & 100 & 110 & 120 & 130 \\
E & 155 & 200 & 250 & 305 & 360 & 425 & 495 & 570 & 645 \\
\hline
\end{array} \]

\[ \text{Freeways and Expressways} \]

\[ \begin{array}{|c|c|}
\hline
\text{MPH} & 50 & 55 & 60 & 65 \\
\hline
\text{D (ft)} & 100 & 110 & 120 & 130 \\
\text{E (ft)} & 425 & 495 & 570 & 645 \\
\hline
\end{array} \]

\[ \text{Note: D and E distances are provided for various speeds on all highways including Freeways and Expressways.} \]

\[ \text{(See Sheet 2 of 2 for Notes)} \]
NOTES

1. Remove conflicting pavement markings.

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.

3. For left lane closures, the Left Lane Closed Sign (W20-5L) shall be used in place of the W20-5R Sign, and the Pavement Width Translation-Left Lane Ends Sign (W4-2L) shall be used in place of the W4-2R Sign.

4. When a highway-rail grade crossing exists within the work zone, or it is anticipated that queues resulting from the lane closure might extend through a highway-rail grade crossing, provisions shall be made to eliminate conflicts, which may require placing a flagger at the crossing. Coordination with the railroad is essential.

5. Where speed or volume is higher, signing such as additional Right Lane Closed XX ft Sign (W20-5R) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.

6. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be 1/2 D Max.

7. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.

8. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways and Freeways. Use of a TMA is optional on all other Highways when a shadow vehicle is used.
LONG-TERM STATIONARY OPERATION
THREE LANE, DIVIDED OR ONE-WAY ROADWAY - WORK AREA IN THE CENTER LANE

- ROAD WORK
  **
  W20-1
  **
  LEFT LANE CLOSED
  W20-5L
  LEFT LANE CLOSED
  W20-5L
  L Min.*
  1/3 L Min.*
  (See Note 2)
  **
  END ROAD WORK
  W20-2
  250' to 500'
  60" x 24"

Install temporary yellow edge line
Install temporary white edge line,
see Note 5.

16' Min.

W9-3A
48" x 48"

W12-1
36" x 36"

- Shoulder

2L Min.*

- Shoulder

1/2 D Max.
(typ. for all papers)

Temporary white line (optional)

(See Note 6)

DISTANCE PLAQUES ON ADVANCE WARNING SIGNS SHALL BE THE SAME SERIES TYPE.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 1000 ft., W20-5L sign distance plaque to read 1500 ft.
C = 1040 ft., W20-1 sign distance plaque to read 1/2 MILE.
D = 2 times the normal speed limit.

CONDITION 2: For Urban Streets
A = 800 ft. and C = 300 ft. and sign distance plaque to read "AHEAD"
B = 1000 ft.

CONDITION 3: For Freeway and Expressway Highways
A = 1000 ft.

CONDITION 4: For Urban Streets
A = 800 ft.
B = 1000 ft.
C = 1640 ft., W20-5L sign distance plaque to read 1/2 MILE
D = 2 times the normal speed limit.

NOTES:
1. Remove conflicting pavement markings.
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.
3. A reversed pattern, beginning with a right lane closure, may also be used.
4. Where speed or volume is higher, signage such as additional Left Lane Closed XX ft Sign (W20-5L) or Be Prepared To Stop Sign (W3-6) should be used in advance of the W20-1 sign.
5. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be 1/2 D Max.
6. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
7. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways and Freeways. Use of a TMA is optional on all other Highways when a shadow vehicle is used.
LONG-TERM STATIONARY OPERATION
DIVIDED OR ONE-WAY HIGHWAY - WORK AREA IN TWO ADJACENT LANES

Required for Freeways and Expressways when workers are present, but Optional for all other Highways, see Note 7.

Install temporary white edge line, see Note 5.

D Max. (typ. for all tapers)

Shoulder

(See Note 6)

(See Note 6)

F C B A L Min.** 2L Min.** L Min.** E

200' 250' to 500' Max.

(See Note 2)

1/3 L Min.**

** See General Notes, Tables, and Legend Drawing for Taper Length (L).

Distance plaques on Advance Warning signs shall be the same series type.

Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways): A = 500 ft.
B = 1000 ft., W20-5AR sign distance plaque to read 1500 ft.
C = 1140 ft., W20-5AR sign distance plaque to read 1/2 MILE.
F = 1/3 MILE, W20-1 sign distance plaque to read 1 MILE.

CONDITION 2: For Urban Streets:
A, B and F = 200 ft. and sign distance plaque to read "AHEAD" (Distance C and the second W20-5AR sign may be eliminated)

CONDITION 3: For Freeway and Expressway Highways:
A = 1000 ft.
B = 1640 ft., W20-5AR sign distance plaque to read 1/2 MILE
C = 2640 ft., W20-5AR sign distance plaque to read 1 MILE.
F = 1 MILE, W20-1 sign distance plaque to read 2 MILES.

NOTES

1. Remove conflicting pavement markings.
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.
3. If the two left lanes are closed, the Left Two Lanes Closed Ahead Sign (W20-5AL) shall be used instead of the W20-5AR Sign.
4. When speed or volume is higher, signing such as additional Right Two Lanes Closed XX ft Sign (W20-5AR) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 Sign.
5. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be 1/3 D Max.
6. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
7. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA) on Expressways and Freeways. Use of a TMA is Optional on all other Highways when a shadow vehicle is used.

PATA
35
NOTES

1. Remove conflicting pavement markings.
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.
3. The design criteria contained in Publication 13M (Design Manual Part 2-Highway Design) should be used for determining the alignment.
4. In locations with heavy ramp traffic, the channelizing devices in advance of the ramp may be eliminated if special advance signing is erected to indicate that the right lane is a mandatory exit only lane.
5. The temporary EXIT sign shall be located in the temporary gore. It shall be mounted a minimum of 7 ft from the pavement surface to the bottom of the sign.
6. Where speed or volume is higher, signing such as additional Right Lane Closed XX ft Sign (W20-5R) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
7. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be 1/2 D Max.
8. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
9. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA).
NOTES

1. Remove conflicting pavement markings.
2. An acceleration lane of sufficient length should be provided whenever possible.
3. Where inadequate acceleration distance exists for the temporary entrance, the Yield (R1-2) and Yield Ahead (W3-2) signs shall be replaced with Stop (R1-1) and Stop Ahead (W3-1) Signs.
4. Where speed or volume is higher, signing such as additional Right Lane Closed XX ft Sign (W20-5R) or Be Prepared To Stop Sign (W3-4) should be used in advance of the W20-1 sign.
5. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be 1/2 D Max.
6. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
7. Shadow vehicle shall be equipped with a Truck Mounted Attenuator (TMA).
Distance plaques on Advance Warning signs shall be the same series type.
Example: either all XXX ft. or all "AHEAD"

CONDITION 1: All Highways (except Freeways and Expressways)
A = 500 ft.
B = 1000 ft., W20-5R sign distance plaque to read 1500 ft.
C = 1640 ft., W20-5R sign distance plaque to read ½ MILE
D = 2 times the normal speed limit.
F = ½ Mile, W20-1 sign distance plaque to read 1 MILE

CONDITION 2: For Urban Streets
A, B and F = 200 ft. and sign distance plaque to read "AHEAD"
D = 2 times the normal speed limit.

CONDITION 3: For Freeway and Expressway Highways
A = 1000 ft.
B = 1640 ft., W20-5AR sign distance plaque to read ½ MILE
C = 2640 ft., W20-5AR sign distance plaque to read 1 MILE
D = 2 times the normal speed limit.
F = 1 Mile, W20-1 sign distance plaque to read 2 MILES
NOTES
1. Remove conflicting pavement markings.
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 (see PATA 71).
3. See PATA GENERAL, Table 5 for size of the Flashing Arrow Panel.
4. The maximum length of temporary one-lane operations, excluding transitions, should not exceed approximately 3 miles. Temporary one-lane operations longer than approximately 3 miles shall only be permitted if justified by an engineering analysis of crossover locations, traffic operations, safety, and other related factors.
5. The alignment of the crossover may be designed as a reverse curve. When the crossover follows a curved alignment, the design criteria contained in Publication 13M (Design Manual Part 2-Highway Design) should be used.
6. For existing concrete pavements, temporary bituminous overlays should be used as shown to cover misleading pavement joints.
7. Signs for this approach shall follow the same configuration as the other direction, using the W20-5L and W4-2R Signs in place of the W20-5R and W4-2R Signs respectively.
8. Where speed or volume is higher, signing such as additional Right Lane Closed XX ft Sign (W20-5R) or Be Prepared To Stop Sign (W5-4) should be used in advance of the W20-1 sign.
9. Where channelizing devices are used instead of pavement markings for edge lines, the spacing shall be ½ D Max.
NOTES

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 (R11-3A) and Detour (M4-10) Signs on the Type III Barricades may be located at the edge of the traveled way.

3. Unless otherwise specified, all traffic control devices for the detour shall be furnished, erected, modified, maintained, and subsequently removed by the contractor for contract operations or by the permittees for permit operations.

4. All detours involving State-designated highways shall have the prior approval of the Department, and all detours involving local highways shall have the prior approval of the appropriate local authorities.

5. The size of the Route Marker Assemblies shall comply with Publication 236M.

6. Where speed or volume is higher, additional signing should be used.

7. For scheduled or emergency closures of 7 consecutive days or less, PATA 39B may be used.
NOTES

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/desination points beyond the intersection, the Road Closed (R11-3A) and Detour (M4-10) Signs on the Type III Barricades may be placed at the edge of the traveled way.
3. Unless otherwise specified, all traffic control devices for the detour shall be furnished, erected, modified, maintained, and subsequently removed by the contractor for contract operations or by the permittee for permit operations.
4. All detours involving State-designated highways shall have the prior approval of the Department, and all detours involving local highways shall have the prior approval of the appropriate local authorities.
5. At locations where there are overlapping detours or several detours within the same area, street names may be added above the M4-9L and M4-9R signs, or signs with different colored arrows may be used to designate the different detour routes. The design and application of signs displaying colored arrows shall comply with Publication 236M.
6. On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.
7. Where speed or volume is higher, additional signing should be used.
NOTES

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. Use channelizing devices to separate and maintain temporary pedestrian walkway while sidewalk is closed. Where high speeds are anticipated, a temporary traffic barrier and, if necessary, a crash cushion should be used to separate the temporary walkways from vehicular traffic.

3. Only the temporary traffic control devices related to pedestrians are shown. Other devices, such as lane closure signing or Road Narrows signs, may be used to control vehicular traffic.
NOTES

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.

3. Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.

4. Only the temporary traffic control devices related to pedestrians are shown. Other devices, such as lane closure signing or Road Narrows signs, may be used to control vehicular traffic.
PUBLICATION 213
TEMPORARY BITUMINOUS RUMBLE STRIP PATTERNS

RUMBLE STRIP PATTERN A

15 Strips
15 Strips
15 Strips
20 Strips

50'
100'
100'
200'

RUMBLE STRIP PATTERN B

15 Strips
15 Strips
15 Strips
20 Strips

50'
50'
100'
100'
200'
20 Strips

Channelizing Device

RUMBLE STRIP AREA

Desirable to extend pattern onto shoulders

Bituminous overlay

Edge of roadway

15 or 20 Strips

12"

4"

½"
Appendix

Appendix A - Temporary/Portable Traffic Signals general notes and applications
Appendix B – Temporary Barrier Deflection Distances
Appendix A
Appendix A – Portable Traffic Control Signals

SECTION 1: GENERAL NOTES FOR PORTABLE TRAFFIC CONTROL SIGNALS

1.1 Portable traffic control signals may be used for stationary, short-term or stationary, long-term operations. For the purposes of portable traffic control signals, short-term operations shall be defined as daylight work areas with work in active progress, emergency nighttime work areas with work in active progress, or work areas of relatively short duration where work begins during daylight and continues in active progress during hours of darkness. Work in active progress means that workers, other than flaggers, are present and are actively engaged in performing the necessary work. In addition to work areas, portable traffic control signals may also be authorized for special events and applications that comply with the basic requirements of the applicable figure.

1.2 Unless indicated otherwise, all terms used on PATA 26e PL and PATA 26e PS shall be as defined in PennDOT Publications 212 and 213.

1.3 A minimum of two signal faces on each approach should be continuously visible to approaching traffic from a point at least the following distance in advance of the portable traffic control signal unit:

<table>
<thead>
<tr>
<th>Normal Speed Limit (MPH)</th>
<th>Minimum Visibility Distance (FT.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>215</td>
</tr>
<tr>
<td>30</td>
<td>270</td>
</tr>
<tr>
<td>35</td>
<td>325</td>
</tr>
<tr>
<td>40</td>
<td>390</td>
</tr>
<tr>
<td>45</td>
<td>460</td>
</tr>
<tr>
<td>50</td>
<td>540</td>
</tr>
<tr>
<td>55</td>
<td>625</td>
</tr>
</tbody>
</table>

1.4 Signal supports should be a minimum of 2 feet off the edge of travel way. If this is not possible, the supports shall be adequately protected by barrier, guiderail, or channelizing devices.

1.5 The bottom of the housing of a signal face suspended over the roadway shall be a minimum of 15 feet, but not more than 19 feet, above the pavement. The bottom of the housing of a signal face that is not mounted over the roadway shall be at least 8 feet, but not more than 15 feet, above the sidewalk or, if there is no sidewalk, above the pavement grade at the center of the roadway.

1.6 Additional signs and devices shall be installed as required in PennDOT Publications 212 and 213, and as required based on actual site conditions.

1.7 Signal modules and lamps must be replaced in accordance with the manufacturer’s recommendations, and a record of this must be maintained by the user.
Appendix A – Portable Traffic Control Signals

1.8 When not in operation, signal heads shall be removed from the view of traffic or hooded with an opaque material that covers and hides the signal indications from the view of traffic. All inappropriate signs shall also be removed, covered, folded, or turned so that they are not readable by oncoming traffic when the portable traffic control signal is not in operation.

1.9 PennDOT reserves the right to inspect each portable traffic control signal usage. PennDOT also reserves the right to revoke a portable traffic control signal permit or to suspend the operation of the portable traffic control signal if the user shall at any time willfully or negligently fail to comply with the conditions contained in the permit or Publication 213, or fail to make any changes in the operation of the signal, or to remove it, when so ordered by PennDOT. The user shall not make any change in the operation of the portable traffic control signal as defined in the permit drawings without prior written approval of PennDOT.
SECTION 2: SHORT-TERM STATIONARY OPERATION OF PORTABLE TRAFFIC CONTROL SIGNALS

2.1 The use of portable traffic control signals in Pennsylvania for short-term operations shall comply with the provisions of PATA 26e PS.

2.2 Except as provided in Note 2.6 pertaining to manual control, advance written approval, in the form of a PennDOT portable traffic control signal permit, must be obtained from PennDOT prior to using portable traffic control signals for short-term operations on any public highway. The user must maintain a copy of the PennDOT portable traffic control signal permit and any submitted Notice of Commencement Form on-site during the period of portable traffic control signal usage.

2.3 To be considered for approval, a completed application for a permit to operate portable traffic control signals must be submitted to PennDOT’s appropriate Engineering District Office, except as provided in Note 2.6 pertaining to manual control. Submit the completed application as early as possible. It must be received by PennDOT at least 15 working days prior to the desired beginning date of portable traffic control signal usage to enable PennDOT to respond before that desired starting date of usage.

2.4 Except as indicated in Notes 2.5, 2.6, and 2.7, the completed application must be accompanied by a site-specific plan indicating the proposed work zone traffic control, portable traffic control signal locations, and operation (phasing, timing, etc.) taking into account work operations, roadway geometry, nearby intersections and driveways, and other pertinent factors. The plan should be prepared in accordance with the guidelines contained in PennDOT Publication 149M, and the available sight distance to each signal shall be indicated.

2.5 If all of the following conditions are satisfied, a site-specific plan may not be required in conjunction with the submission of a completed application for a permit to operate portable traffic control signals:

a. The operation will be a stationary, short-term operation as defined in PennDOT Publications 212 and 213.

b. The portable traffic control signals will be used to control one-lane, two-way traffic, and no more than two approaches to the work zone will be controlled by the portable traffic control signals.

c. There will be no at-grade railroad crossing within the one-lane, two-way traffic section (between STOP HERE ON RED signs) and within 300 feet of a portable traffic control signal.

d. No roadway approach to a portable traffic control signal will be on a downgrade of 5% or more, if the normal speed limit is greater than 35 miles per hour.
Appendix A – Portable Traffic Control Signals

e. There will be no intersections or uncontrolled commercial driveways within the one-lane, two-way traffic section. The proposed method of traffic control for non-commercial driveways shall be acceptable to PennDOT.

f. The roadway ADT (average daily traffic) and length of one-way, two-way traffic section (between STOP HERE ON RED signs) meet one of the following conditions:

<table>
<thead>
<tr>
<th>Maximum ADT (VEH./DAY)</th>
<th>Maximum Accompanying Length of One-Lane, Two-Way Traffic Section (FT.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,000 (6,500*)</td>
<td>1,000</td>
</tr>
<tr>
<td>5,000 (7,500*)</td>
<td>750</td>
</tr>
<tr>
<td>6,000 (9,000*)</td>
<td>500</td>
</tr>
<tr>
<td>7,000 (11,000*)</td>
<td>300</td>
</tr>
</tbody>
</table>

* NOTE: These higher maximum ADT values are only applicable if portable traffic control signal usage will be limited to non-peak hours (i.e., other than 7:00 to 9:00 AM and 4:00 to 6:00 PM).

2.6 If the portable traffic control signal will be operated solely in a manually-controlled mode of operation in compliance with Notes 2.5a through 2.5e, a portable traffic control signal permit and a site-specific plan will not be required. However, the user must submit a Notice of Commencement Form to the appropriate PennDOT Engineering District Office so that it is received at least 72 hours before the desired beginning time of the portable traffic control signal usage at each specific site, except for emergency work as defined in PennDOT Publication 212.

a. For manual control, a single operator may be used if the operator has an unobstructed view of both traffic traveling through the one-lane, two-way section and traffic on the approach to each portable traffic control signal unit. Otherwise, a separate operator is required at each portable traffic control signal unit and communications must be maintained between the operators.

b. When manual control is used, supplemental signal indicator lamps are required to show the operator the status of the signal indications if the controller does not provide a visual display of the signal indications.

2.7 For repeated users of portable traffic control signals, PennDOT’s appropriate Engineering District Office, at its discretion, may waive the need for a site-specific plan and/or may issue a blanket portable traffic control signal permit covering multiple locations and dates of operation for up to a one-year period. These actions will only be considered by PennDOT’s appropriate Engineering District Office if that user has properly used portable traffic control signals in a safe and efficient manner within that District on numerous past occasions without problems and in compliance with PennDOT
Appendix A – Portable Traffic Control Signals

requirements, and with the understanding that all portable traffic control signal usage under the blanket permit will satisfy Notes 2.5a through 2.5e. In the case of a blanket permit, the user must submit a Notice of Commencement Form to the appropriate PennDOT Engineering District Office so that it is received at least 72 hours before the desired beginning time of the portable traffic control signal usage at each specific site, except for emergency work as defined in PennDOT Publication 212.

2.8 Signal heads on the left side of the roadway may not be necessary for portable traffic control signal units that have two signal heads and at least one is on a mast arm over the roadway, provided that signal visibility is adequate.

2.9 The length of yellow change intervals is normally in the range from about 3 seconds to 6 seconds. Use a 5-second yellow change interval, or an appropriate alternate value from PennDOT Publication 149M based on actual site conditions.

2.10 An all-red clearance interval must be used. The length of the all-red clearance interval is based on the length of the one-lane, two-way traffic section controlled by the portable traffic control signals and the speed of traffic through that section. Monitor traffic operations during the period of portable traffic control signal usage and adjust the length of the all-red clearance interval to account for site conditions and to provide for safe and efficient traffic operations. Unless otherwise indicated by PennDOT, the minimum length of all-red clearance intervals shall be as follows for fixed time and actuated operation:

| Length of One-Lane, Two-Way Traffic Section between STOP HERE ON RED SIGNS (FT.) | Required Minimum Length of All-Red Clearance Interval (SEC.) |
|---|---|---|
| | 15 MPH | 20 MPH | 25 MPH |
| 1,000 | 45 | 34 | 27 |
| 950 | 43 | 32 | 26 |
| 900 | 41 | 31 | 25 |
| 850 | 39 | 29 | 23 |
| 800 | 36 | 27 | 22 |
| 750 | 34 | 26 | 20 |
| 700 | 32 | 24 | 19 |
| 650 | 30 | 22 | 18 |
| 600 | 27 | 20 | 16 |
| 550 | 25 | 19 | 15 |
| 500 | 23 | 17 | 14 |
| 450 | 20 | 15 | 12 |
| 400 | 18 | 14 | 11 |
| 350 | 16 | 12 | 10 |
| 300 | 14 | 10 | 8 |
2.9 For fixed time and actuated operation, the minimum green interval provided for each approach shall be 10 seconds, unless otherwise indicated by PennDOT. The length of green intervals should be such as to provide for safe and efficient traffic operations. Use green intervals as indicated on the permit drawing. If there is no permit drawing, monitor traffic operations as traffic volumes change throughout the period of portable traffic control signal usage and adjust green intervals to provide for safe and efficient traffic operations.
Appendix A – Portable Traffic Control Signals

SECTION 3: LONG-TERM STATIONARY OPERATION OF PORTABLE TRAFFIC CONTROL SIGNALS

3.1 The use of portable traffic control signals in Pennsylvania for long-term operations shall comply with the provisions of PATA 26e PL.

3.2 Advance written approval must be obtained from PennDOT prior to using portable traffic control signals for long-term operations on any public highway. A PennDOT portable traffic control signal permit will be required for long-term operations, and a copy must be maintained on-site during the period of portable traffic control signal usage.

3.3 To be considered for approval, a completed application for a permit to operate portable traffic control signals must be submitted to PennDOT’s appropriate Engineering District Office. Submit the completed application as early as possible. It must be received by PennDOT at least 15 working days prior to the desired beginning date of portable traffic control signal usage to enable PennDOT to respond before that desired starting date of usage.

3.4 The completed application must be accompanied by a site-specific plan indicating the proposed work zone traffic control, portable traffic control signal locations, and operation (phasing, timing, etc.) taking into account work operations, roadway geometry, nearby intersections and driveways, and other pertinent factors. The plan should be prepared in accordance with the guidelines contained in PennDOT Publication 149M, and the available sight distance to each signal shall be indicated.

3.5 Portable traffic control signals used for long-term operations shall be trailer-mounted units having at least one signal head on a mast arm over the roadway. Pedestal-mounted portable traffic control signal units are not permitted for long-term operations.

3.6 For long-term operations, all signal lenses shall be 12 inches in diameter.

3.7 All portable traffic control signal units used for long-term operations must be interconnected via hard wire or radio to ensure fail-safe operation and proper functioning.

3.8 Steps must be taken to ensure continued proper placement and to forestall possible vandalism of the portable traffic control signal units. Tires and the “hitch” must be removed from the trailer, and battery enclosures, crank mechanisms for horizontal arms, and other mechanisms to adjust placement or operation must be locked to eliminate any tampering by unauthorized personnel.

3.9 The local police department must be provided with the name and telephone number of an emergency contact person who is available 24 hours per day, 7 days a week during the period of portable traffic control signal usage.
Appendix A – Portable Traffic Control Signals

3.10 Pedestrian accommodation considerations, winter maintenance activities that could cause damage or dislodgement, and other important considerations may result in the denial to use portable traffic control signals for specific long-term operations.
APPLICATION FOR PERMIT TO OPERATE PORTABLE TRAFFIC CONTROL SIGNALS

Applicant: ___________________________________________ Phone No.: ____________________

Address: _______________________________________________________________________

WORK LOCATION

County: ____________________ Municipality: ________________________________

On State Route (SR): _________ Direction: _________________________________

From: Segment: _______ Offset: _________________________________

To: Segment: _______ Offset: _________________________________

On Local Road: _______________ Direction: _________________________________

From: ______________________________________________________________

To: ______________________________________________________________

Normal Speed Limit: _______mph ADT: __________________________ veh/day

Maximum Length of One-Lane, Two-Way Traffic Section ________________________ feet
(Between STOP HERE ON RED Signs)

Date of Portable Signal Usage: Begin ______________ End ______________

Description of Proposed Work:
Proposed Method of Controlling Traffic Emerging from Driveways within One-Lane, Two-Way Traffic Section:

<table>
<thead>
<tr>
<th>Portable Traffic Signal Manufacturer: _____________________________</th>
<th>Model: _____________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>PennDOT Approval No.: ________________________________________</td>
<td></td>
</tr>
<tr>
<td>Mode of Operation: Manual _________ Fixed Time __________ Actuated _______</td>
<td></td>
</tr>
<tr>
<td>Interconnection: Hard Wire ________ Radio _______ None (Quartz Timers) ___________</td>
<td></td>
</tr>
<tr>
<td>Other (Please describe) ______________________________________</td>
<td></td>
</tr>
</tbody>
</table>

Name of Emergency Contact Person: ____________________ Phone No.: __________________
(Must be available 24 hrs./day, 7 days/week during period of portable signal usage.)

<table>
<thead>
<tr>
<th>Check all that apply</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>The operation will be a “stationary, short-term operation” as defined in PennDOT Publications 212 and 213.</td>
</tr>
<tr>
<td>b.</td>
<td>The portable traffic control signals will be used to control one-lane, two-way traffic, and no more than two approaches to the work zone will be controlled by portable traffic control signals.</td>
</tr>
<tr>
<td>c.</td>
<td>There will be no at-grade railroad crossing within the one-lane, two-way traffic section (between STOP HERE ON RED signs) and within 300 feet of a portable traffic control signal.</td>
</tr>
<tr>
<td>d.</td>
<td>No roadway approach to the portable traffic control signal will be on a downgrade of 5% or more, if the normal speed limit is greater than 35 miles per hour.</td>
</tr>
<tr>
<td>Check all that apply</td>
<td>Criteria (Continued)</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>e. There will be no intersections or uncontrolled commercial driveways within the one-lane, two-way traffic section.</td>
<td></td>
</tr>
<tr>
<td>f. The roadway ADT (average daily traffic) and length of one-way, two-way traffic section (between STOP HERE ON RED signs) meet one of the following conditions:</td>
<td></td>
</tr>
<tr>
<td>Maximum ADT (VEH./DAY)</td>
<td>Maximum Accompanying Length of One-Lane, Two-Way Traffic Section (FT.)</td>
</tr>
<tr>
<td>4,000 (6,500*)</td>
<td>1,000</td>
</tr>
<tr>
<td>5,000 (7,500*)</td>
<td>750</td>
</tr>
<tr>
<td>6,000 (9,000*)</td>
<td>500</td>
</tr>
<tr>
<td>7,000 (11,000*)</td>
<td>300</td>
</tr>
</tbody>
</table>

*NOTE: These higher maximum ADT values are only applicable if portable traffic control signal usage will be limited to non-peak hours (i.e., other than 7:00 to 9:00 AM and 4:00 to 6:00 PM).

To be considered for approval, submit this completed application to PennDOT’s appropriate Engineering District Office as early as possible. It must be received by PennDOT at least 15 working days prior to the desired beginning date of portable traffic control signal usage to enable PennDOT to respond before that desired starting date of usage.

Except as provided below, this completed application must be accompanied by a site-specific plan indicating the proposed work zone traffic control, portable traffic control signal locations, and operation (phasing, timing, etc.) taking into account work operations, roadway geometry, nearby intersections and driveways, and other pertinent factors. The plan should be prepared in accordance with the guidelines contained in PennDOT Publication 149M, and the available sight distance to each signal shall be indicated.

If all of the criteria (Criteria a through f) in the above table are satisfied (checked), a site-specific may not be required.
If the portable traffic control signal will be operated solely in a manually-controlled mode of operation and Criteria a through e in the above table are satisfied (checked), a completed application, a portable traffic control signal permit, and a site-specific plan will not be required. However, the user must submit a Notice of Commencement Form to the appropriate PennDOT Engineering District Office so that it is received at least 72 hours before the desired beginning time of the portable traffic control signal usage at each specific site, except for emergency work as defined in PennDOT Publication 212.

For repeated users of portable traffic control signals, PennDOT’s appropriate Engineering District Office, at its discretion, may waive the need for a site-specific plan and/or may issue a blanket portable traffic control signal permit covering multiple locations and dates of operation for up to a one-year period. These actions will only be considered by PennDOT’s appropriate Engineering District Office if that user has properly used portable traffic control signals in a safe and efficient manner within that District on numerous past occasions without problems and in compliance with PennDOT requirements, and with the understanding that all portable traffic control signal usage under the blanket permit will satisfy Criteria a through e in the above table. In the case of a blanket permit, the user must submit a Notice of Commencement Form to the appropriate PennDOT Engineering District Office so that it is received at least 72 hours before the desired beginning time of the portable traffic control signal usage at each specific site, except for emergency work as defined in PennDOT Publication 212.

The applicant certifies that the information provided on this application and accompanying documents is true and correct.

The applicant certifies that, if approved, the portable traffic control signals will be operated and maintained in compliance with PennDOT Publications 212 and 213, and the provisions of the portable traffic control signal permit as issued by PennDOT.

The applicant agrees that it will indemnify, save harmless and defend (if requested) the Commonwealth of Pennsylvania, its agents, representatives and employees, from all suits, actions or claims of any character, name or description, damages, judgments, expenses, attorneys’ fees and compensation arising out of personal injury, death or property damage, sustained or alleged to have been sustained in whole or in part by any and all persons whatsoever as a result of or arising out of any act, omission, neglect or misconduct of the applicant, its officers, agents, contractors or employees, during the period of portable traffic control signal usage.

BY: _______________________________________ _____________________________

Signature of Applicant       Date

Sworn before me this _________________ day of _________________, 20______

Notary: ____________________________________
PORTABLE TRAFFIC CONTROL SIGNAL PERMIT

In accordance with the Vehicle Code, the Pennsylvania Department of Transportation (PennDOT) hereby approves the operation of a portable traffic control signal as follows:

Location:

Date(s) of Operation:

This permit is issued to, and accepted by, _______________________________________________________, hereinafter known as the Permittee, as follows:

The operation and maintenance of this portable traffic control signal by the Permittee shall be in accordance with requirements contained on the attached sheets and application, PennDOT’s figures governing the use of portable traffic control signals as contained in PennDOT Publication 213, and the following special requirements:

All work performed by the Permittee with respect to the operation and maintenance of this portable traffic control signal shall be under and subject to the direction of PennDOT. The said Permittee shall use due diligence in the execution of the work authorized under this permit and shall not obstruct or endanger travel along the said road. All operations must be conducted so as to permit safe and reasonable free travel at all times over the road within the limits of the work herein permitted.

The Permittee agrees to indemnify, save harmless and defend (if requested) the Commonwealth of Pennsylvania, its agents, representatives and employees, from all suits, actions or claims of any character, name or description, damages, judgments, expenses, attorneys’ fees and compensation arising out of personal injury, death or property damage, sustained or alleged to have been sustained in whole or in part by any and all persons whatsoever as a result of or arising out of any act, omission, neglect or misconduct of the Permittee, its officers, agents, contractors or employees, during the period of portable traffic control signal usage.

PennDOT reserves the right to revoke this permit or to suspend the operation of the portable traffic control signal if the Permittee shall at any time willfully or negligently fail to comply with the conditions contained in this permit or PennDOT Publication 213, or fail to make any changes in the operation of this signal, or to remove it, when so ordered by PennDOT. The Permittee shall maintain the signal in a safe condition at all times. The Permittee shall not make any change in the operation of the portable traffic control signal as defined in the permit drawings without prior written approval of PennDOT. PennDOT reserves the right to inspect this portable traffic control signal usage at any time.

Date: ______________________   Approved: ______________________

Secretary of Transportation
Commonwealth of Pennsylvania

By: ______________________

District Executive
Pennsylvania Department of Transportation
Engineering District ________
NOTICE OF COMMENCEMENT FORM
FOR PORTABLE TRAFFIC CONTROL SIGNAL USAGE

Notice is hereby given that portable traffic control signal usage will occur as follows:

User Name: _________________________________________ Phone No.: _________________
User Company: _________________________________________________________________
Address: _______________________________________________________________________
_______________________________________________________________________
DATE OF PORTABLE SIGNAL USAGE: Begin _____________ End _______________

WORK LOCATION

County: ______________________ Municipality: _______________________________
On State Route (SR): __________ Direction: _________________________________
  From: Segment: ______ Offset: _________________________________
  To: Segment: ______ Offset: _________________________________
On Local Road: _______________ Direction: _________________________________
  From: _________________________________
  To: _________________________________

Description of Proposed Work:

Portable Traffic
Signal Manufacturer: _____________________ Model: _____________________________
PennDOT
Approval No.: __________________________
Check all that apply | Criteria
--- | ---
a. | The operation will be a “stationary, short-term operation” as defined in PennDOT Publications 212 and 213.
b. | The portable traffic control signals will be used to control one-lane, two-way traffic, and no more than two approaches to the work zone will be controlled by portable traffic control signals.
c. | There will be no at-grade railroad crossing within the one-lane, two-way traffic section (between STOP HERE ON RED signs) and within 300 feet of a portable traffic control signal.
d. | No roadway approach to the portable traffic control signal will be on a downgrade of 5% or more, if the normal speed limit is greater than 35 miles per hour.
e. | There will be no intersections or uncontrolled commercial driveways within the one-lane, two-way traffic section.

If the portable traffic control signal will be operated solely in a manually-controlled mode of operation and Criteria a through e in the above table are satisfied (checked), the user must submit this completed Notice of Commencement Form to the appropriate PennDOT Engineering District Office so that it is received at least 72 hours before the desired beginning time of the portable traffic control signal usage at each specific site, except for emergency work as defined in PennDOT Publication 212.

For repeated users of portable traffic control signals, PennDOT’s appropriate Engineering District Office, at its discretion, may issue a blanket portable traffic control signal permit covering multiple locations and dates of operation for up to a one-year period. These actions will only be considered by PennDOT’s appropriate Engineering District Office if that user has properly used portable traffic control signals in a safe and efficient manner within that District on numerous past occasions without problems and in compliance with PennDOT requirements, and with the understanding that all portable traffic control signal usage under the blanket permit will satisfy Criteria a through e in the above table. In the case of a blanket permit, the user must submit this completed Notice of Commencement Form to the appropriate PennDOT Engineering District Office so that it is received at least 72 hours before the desired beginning time of the portable traffic control signal usage at each specific site, except for emergency work as defined in PennDOT Publication 212.
The user certifies that Criteria a through e in the above table are satisfied, and the portable traffic control signal:

______ Will be operated solely in a manually-controlled mode of operation, and/or

______ Will be operated in accordance with Blanket Permit No. ______________

The user certifies that the information provided on this form is true and correct.

The user certifies that the portable traffic control signals will be operated and maintained in compliance with PennDOT Publications 212 and 213, and the provisions of any portable traffic control signal permit as issued by PennDOT.

The user agrees that it will indemnify, save harmless and defend (if requested) the Commonwealth of Pennsylvania, its agents, representatives and employees, from all suits, actions or claims of any character, name or description, damages, judgments, expenses, attorneys’ fees and compensation arising out of personal injury, death or property damage, sustained or alleged to have been sustained in whole or in part by any and all persons whatsoever as a result of or arising out of any act, omission, neglect or misconduct of the user, its officers, agents, contractors or employees, during the period of portable traffic control signal usage.

BY: _______________________________________ _____________________________
    Signature of User       Date
Appendix B
Appendix B
Temporary Barrier Deflection Distances Table

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>FHWA Acceptance Designation</th>
<th>Section Minimum Length</th>
<th>Tested Height</th>
<th>Shape</th>
<th>Tested * Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYSDOT</td>
<td>I-Beam</td>
<td>B-94</td>
<td>20 ft.</td>
<td>32”</td>
<td>F &amp; NJ</td>
<td>4.2 ft.</td>
</tr>
<tr>
<td>Rockingham Precast</td>
<td>T-Shape Connector</td>
<td>B-42</td>
<td>12 ft</td>
<td>32”</td>
<td>F</td>
<td>3.8 ft</td>
</tr>
<tr>
<td>Easi-Set Industries</td>
<td>J-J Hook</td>
<td>B-52</td>
<td>12 ft.</td>
<td>32”</td>
<td>F &amp; NJ</td>
<td>4.2 ft.</td>
</tr>
<tr>
<td>Easi-Set Industries</td>
<td>J-J Hook</td>
<td>HSA-10</td>
<td>12 ft.</td>
<td>54”</td>
<td>F</td>
<td>4.2 ft.</td>
</tr>
<tr>
<td>Virginia DOT</td>
<td>Pin &amp; Loop</td>
<td>B-54</td>
<td>20 ft.</td>
<td>32”</td>
<td>F</td>
<td>6.0 ft.</td>
</tr>
<tr>
<td>Ohio DOT</td>
<td>Pin &amp; Loop</td>
<td>B-93</td>
<td>10 ft.</td>
<td>32”</td>
<td>F &amp; NJ</td>
<td>5.5 ft.</td>
</tr>
<tr>
<td>Pennsylvania DOT</td>
<td>Plate</td>
<td>B-79</td>
<td>12 ft.</td>
<td>34”</td>
<td>F</td>
<td>8.4 ft.</td>
</tr>
</tbody>
</table>

* The deflection distances shown in this table resulted from controlled crash tests at a 25 degree impact angle. The severe impact angle crash test may not be representative of actual field conditions.

If you have questions contact the Bureau of Design, Highway Quality Assurance Division at (717) 787-5023 and ask for the Standards and Criteria Section.