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Foreword

This booklet was prepared for employees of the Illinois Department of Transportation only. This is the Department's policy for the proper application of traffic control devices for all operations work. Snow and ice control worker and emergency traffic patrol worker requirements are covered by the Safety Code. These cases establish the minimum requirements. If additional devices are needed to enhance safety, they should be added when necessary.

The proper use and most effective placement of traffic control devices is required to prevent injury to employees and the public. Planning should be part of every job so that work can proceed in a safe, efficient, and orderly manner with minimal interference to motorists.

Each Case herein has been developed to meet the requirements of the "Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI."
Foreword - Continued

These cases establish minimum requirements which will provide a reasonable level of safety. Application of these requirements cannot, however, guarantee the safety of every work site. Each worker and supervisor should therefore be alert for any circumstance which could require change, including the application of additional devices. When specific operations are not covered, a Traffic Control Plan should be developed for the special application.

Each employee is responsible for the maintenance of devices and adjustments of traffic control to ensure the safety of the employees and the motorists. For work operations expected to be in place for more than 48 hours, a Traffic Control Plan must be developed and approved by the Operations Manager.

All employees must be in compliance with Section 24 of the "Employee Safety Code" for proper outer wear.

See "Flagger Handbook" for flagging requirements.
Traffic Control Devices

The following pages describe some of the most frequently used traffic control devices. For these devices to perform successfully they must be of good quality, their placement must be proper and their position must be maintained. All devices should be periodically evaluated using the Quality Standard for Work Zone Traffic Control Devices.

Distances stated in this manual are guides. Field conditions may force adjustments to maximize visibility of flaggers and signs in some work zones. In general, small increases in distance are acceptable. Decreases in distance should only be used for unique situations where an increase in distance will not work.

General Safety Requirement:

a) When a lane is closed, the taper and buffer space should be free of equipment, trucks, and materials, when applicable.

b) All equipment, trucks, and materials should be parked on the shoulder or downstream from the protective truck.
Drums, Barricades and Cones

Traffic cones are used to guide traffic from one lane to another and to separate work zones from the traveled way. Cones shall be a minimum height of 18 inches. Cones having a height of 28 inches shall be used on roadways having speeds of 45 mph and greater and for installations at night. At night, reflectorized cones, drums, or barricades shall be utilized. When reflectorized cones are used for night time operations, workers must be present to maintain them.

Sandbags may only be used on the lower barricade rails. Striped panels facing traffic shall not be covered. Weights of concrete, stone or other materials shall not be used.

Barricades are to be placed so that the stripes slant downward toward the side on which traffic is to pass.
Work Zone Speed Limit Sign

- A 45 or 55 mph work zone speed limit sign will be used on multilane roadways with posted speed limits of either 55 mph or 65 mph where one lane is closed for more than 8 hours, in accordance with the appropriate case. It is legal for IDOT to drop the speed limit 20 mph (in 10 mph increments) from 65 mph to 45 mph in work zones when a work zone speed limit sign is utilized. The sign may be utilized at other locations where work zone speed reduction is desired. When reduced speed limit signs are utilized, all permanent regulatory signs within the work zone must be properly covered.

- This sign should not be mounted on a vehicle. If used with a moving operation, the sign should be relocated on a frequent basis.

- This sign should only be used within a standard series of warning signs. For an example of placement see Case No. WZ-41.

- Contact the Central Bureau of Operations for the current fine amount.
Strobe Lights

When vehicles are located on or within 15 feet of the pavement edge, mounted strobe lights will be utilized. This requirement includes all vehicles parked on the shoulder. Revolving lights are adequate for tractors, while non-truck mounted equipment is exempt, i.e. air compressors, asphalt kettles, etc.

Please Note: Revolving lights on existing vehicles may be utilized until the light wears out or the vehicle is replaced.

Illinois law allows the use of amber/white lights by IDOT personnel, but only when engaged in work operations.

Exception: Unoccupied vehicles, such as vans or pickups with equipment needed for the current work activity, parked in a closed lane as support vehicles. The lane shall be closed using cones, drums, or barricades with a spacing not to exceed 50'. This would apply to those work activities which exceed one hour. The protective vehicles and actual work vehicles, such as a lift, asphalt truck, drill rig, etc. shall have their strobe lights operating.
Warning Signs

Portable signs are for use on streets and roads as a warning of the presence of workers. They are diamond-shaped panels with the symbol for WORKERS in black on a fluorescent orange reflective background.

All warning signs shall be a minimum of 48 inches by 48 inches. Signs mounted on portable stands shall be no less than 12 inches above the travel way. When warning signs are used on a paved surface, sandbags should be used to minimize movements. Signs shall be a minimum of 2 feet and a maximum of 10 feet from the edge of the pavement or face of curb. Placement should be adjusted to field position conditions so they are readily seen by motorists. In general, small increases in sign spacing are acceptable. Spacing of signs should only be decreased when warranted by unique site conditions. The last sign in series should be repeated 500 feet past major intersections and interchanges outside of urban areas.
Message Boards SHALL:

1) Be aimed at approaching traffic.
2) Be dimmed at night.
3) Be placed in advance of any hill crests or sharp corners that would limit visibility to approaching traffic.
4) Be disconnected from tow vehicles for periods of time more than two hours.
5) Provide real time information to motorists on traffic conditions ahead.

On WZ cases 42, 44, and 45 the message board shall be used to display status of lanes within the project. The primary message shall be: "RIGHT LANE CLOSED" / "X MILES AHEAD," "LEFT LANE CLOSED" / "X MILES AHEAD" or "ALL LANES OPEN."
Flashing Arrow Boards (AB) **SHALL:**

1) Be "aimed" at approaching traffic.
2) Be dimmed when used at night.
3) Be used in the caution mode only for:
   A) Work on roadway and shoulders of two-lane two-way roads;
   B) Work on shoulder;
   C) When closing a shoulder;
   D) Roadside work close to the shoulder;
   E) When parked in a closed lane beyond the taper.
4) Be placed in advance of any hill crests or sharp corners that would limit visibility to approaching traffic.
5) Be placed at or close to the start of the lane taper.
6) Be disconnected from tow vehicle for periods of time more than two hours. (Tow vehicle shall be moved so as not to be a hazard.)
7) Have yellow panels closed when not in use.
8) Have yellow panels match direction of flashing arrow.
Sequential arrow displays and chevrons shall not be used.

Note: When a truck mounted AB is utilized, it replaces an AB shown on the case drawing.
Flashing Arrow Boards (AB) Continued

An AB shall comply with the following requirements, any device not meeting these criteria may only be used as a supplemental device. An AB must be rectangular in shape, be of solid construction, and be finished in non-reflective black.

- **Type A** - truck mounted 48" X 24" AB mounted at least 6' high for speeds less than 45 mph.
- **Type B** - truck or trailer mounted 60" X 30" AB mounted at least 6' high for all speeds but less than 24 hour duration.
- **Type C** - truck or trailer mounted 96" X 48" AB shall have a height of 7' for all speeds and all lengths of time.
Flashing Arrow Boards - Continued

Proper Procedures:

1) Two-lane two-way highway

2) Multiple Lane Roadway

3) Merge right or left
   (center lane closure)

4) Caution
Work During Non-Daylight Hours

Work during non-daylight hours sharply reduces worker's and the motorist's visibility of the work area. As a minimum, all workers assigned to work in open traffic lanes at night, such as night maintenance and flaggers, shall wear ANSI Class III Protective Clothing. Other staff working in emergency assignments such as downed tree limbs or sign replacement, are required to wear ANSI Class II garments while outside their vehicle.

Special attention should be given to assure maximum sign retroreflectivity and that lighting of devices is operational. Steady burn lights should be used on barricades and drums when these devices are used for delineation of the traveled way. Flashing lights are used to mark obstructions and hazards. If cones are used at nighttime, retroreflective collars are required and workers must be present to maintain the devices. The flagger station must be lit during non-daylight hours. In addition, consideration should be given to illuminating the work site. Special attention should be given to assuring that auxiliary lights/floodlights do not create a disabling glare for the motorists.

Current highway traffic control standards and details should be followed when developing a traffic control plan for a nighttime operation.
Protective Vehicles with Truck Mounted Attenuators (TMAs)

The purpose of a protective vehicle is to protect both the workers and the motorists. When a protective vehicle is required on a case, a truck mounted attenuator and an arrow board is required unless the protective vehicle is entirely on the shoulder. TMAs shall be utilized at locations shown on the Cases.

Where the TMAs are labeled as optional, extra consideration should be given to the following:

1) Heavy truck volumes.
2) Traffic volumes and speeds.
3) Limited sight distance.

Please note: When a TMA is not available and one is required, the activity shall be postponed until one is available. An arrow board is not an acceptable substitute for a TMA.
Truck Mounted Attenuators (TMA)

When required on a case drawing, a TMA shall be dispatched with the crew.

The driver should exit the truck when the truck is to be stopped for more than 15 minutes.

The truck should have an actual weight of no less than 11,000 pounds and no greater than 26,000 pounds. Higher weights may be used when approved by the TMA manufacturer. The truck should be positioned to allow a roll-ahead distance as follows (or other as recommended by manufacturer):

Stationary Operations - 100 feet minimum
Moving Operations - 180 feet minimum

Note: When utilized in a stationary work operation, the truck should be in neutral and the parking brake engaged.
General Requirements

All traffic control devices should be placed in the order that drivers will see them, starting with the sign or device that is farthest from the work area, placing the others as the work area is approached. Removal should be done in the reverse order or under cases WZ 20, or WZ 40 for moving operations.

All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the pavement unless otherwise authorized by their supervisor or the applicable work zone case. At locations where all vehicles, equipment, workers or their activities are more than 15 feet from the edge of pavement, no traffic control devices are required.

WORKERS and/or FLAGGER signs are to be removed when no work is being performed for more than one hour.

If at all possible, lane closure tapers and the buffer area (see page 18) are to be kept free of any materials, equipment, or workers, except as shown herein.
Locating Distances

All devices shown on CASES should be properly placed and their position maintained. All of the dimensions shown on the Cases for the placement of devices are shown below. Distances on most roadways can easily be located by counting permanent skip-dash stripes. Since the dimensions are minimums and the stripes are spaced at 40 feet centers, adding 1/2 stripe cycle (20 ft.) when needed will keep it simple.

<table>
<thead>
<tr>
<th>Distance in feet</th>
<th>Number of stripes*</th>
<th>Distance in feet / mi.</th>
<th>Number of stripes*</th>
<th>Distance in feet / mi.</th>
<th>Number of stripes*</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>2 1/2</td>
<td>320</td>
<td>8</td>
<td>800</td>
<td>20</td>
</tr>
<tr>
<td>120</td>
<td>3</td>
<td>400</td>
<td>10</td>
<td>1000(2/10)</td>
<td>25</td>
</tr>
<tr>
<td>180</td>
<td>4 1/2</td>
<td>500</td>
<td>12 1/2</td>
<td>1100</td>
<td>27 1/2</td>
</tr>
<tr>
<td>200</td>
<td>5</td>
<td>540(1/10)</td>
<td>13 1/2</td>
<td>1200</td>
<td>30</td>
</tr>
<tr>
<td>220</td>
<td>5 1/2</td>
<td>600</td>
<td>15</td>
<td>1320</td>
<td>33</td>
</tr>
<tr>
<td>240</td>
<td>6</td>
<td>660</td>
<td>16 1/2</td>
<td>1500</td>
<td>37 1/2</td>
</tr>
<tr>
<td>260</td>
<td>6 1/2</td>
<td>720</td>
<td>18</td>
<td>1600(3/10)</td>
<td>40</td>
</tr>
<tr>
<td>300</td>
<td>7 1/2</td>
<td>780</td>
<td>19 1/2</td>
<td>2000</td>
<td>50</td>
</tr>
</tbody>
</table>

|                  |                    |                        |                    | 2600(1/2)              | 65                 |

* Cycles
Glossary

**ADT** - Average Daily Traffic volumes. Use most recent ADT’s on IDOT Internet site.

**Buffer Area** - An area between the lane closure taper and the work area that provides a recovery space for an errant vehicle.

**Intermittent/ Moving Operation** - Operations that stop briefly then move on and operations that are continuously moving.

**Multilane** - Any roadway with more than one lane in each direction, including interstate highways and freeways.

**Roadway type and duration of work** - Major factors to determine the number, placement and type of devices used for temporary traffic control.

**Short Term Operation** - Less than one hour, usually activities in which it takes longer to setup and remove the traffic control than to do the work.

**Work Area** - That portion of a roadway or shoulder that is closed to traffic and set aside for workers, equipment, and materials. It may be stationary or moving.

---

Note: math symbols defined:

- $<$ less than
- $\leq$ less than or equal to
- $>$ greater than
- $\geq$ greater than or equal to
Buffer Areas:

The buffer area as shown in WZ10, pages 20 and 21, provides recovery space for errant vehicles. Neither work activity nor storage should occur in this space.

A guide for the length of longitudinal buffer area is provided. The length may be adjusted to meet individual work site conditions.

**Guide For Length of Longitudinal Buffer Area**

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Length (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>85</td>
</tr>
<tr>
<td>35</td>
<td>120</td>
</tr>
<tr>
<td>40</td>
<td>170</td>
</tr>
<tr>
<td>45</td>
<td>220</td>
</tr>
<tr>
<td>50</td>
<td>280</td>
</tr>
<tr>
<td>55</td>
<td>335</td>
</tr>
<tr>
<td>60</td>
<td>415</td>
</tr>
<tr>
<td>65</td>
<td>485</td>
</tr>
</tbody>
</table>
AREAS IN WORK ZONE

Advance Warning Area: Informs drivers of what to expect ahead.

Transition Area: Moves traffic out of its normal path.

Buffer Area: Provides protection for traffic and workers.
Traffic space allows traffic to pass through the activity area.

100’ Downstream taper (optional)

Work Space: Is set aside for workers, equipment, and material storage.

Termination Area: Lets traffic resume normal driving.
USE OF 1 FLAGGER
ALL SPEEDS
STATIONARY AND MOVING OPERATIONS

* UNRESTRICTED SIGHT DISTANCE
  45 MPH OR MORE

** UNRESTRICTED SIGHT DISTANCE
  40 MPH OR LESS

800’ *

500’ **

Taper plus work area

FLAGGER

100’ Taper

200’ max.

Note:
The flagger controls traffic in the closed lane only. The other lane operates free flow.

Advance warning signs and other devices must be in place in accordance with traffic control plans in this manual.
USE OF ONE FLASHER
Two-Lane Roadway

When one lane is closed on a Two-Lane Highway, one flagger may be used when:

A. The flagger has an unrestricted sight distance beyond the work area as indicated in the diagram.

B. The work area does not exceed 200 feet.

C. The traffic is not delayed more than 3 minutes.

D. The advance warning signs are in place, when applicable.

Unless all of the above conditions are met, two flaggers shall be used.
Guide For Work Zone Cases

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Guideline for Work Zone Case Selection:

The following pages contain listings for most of the work activities together with the MMIS code numbers for day-to-day maintenance and traffic work that are conducted on or adjacent to roads and streets open to traffic. The listings are presented here in the same order they appear on the field reports. In most situations, this reference should help field crews to select the proper traffic control for the type of work and its location.

General notes:

1) Whenever possible, work should be conducted without any intrusion into a travel lane or within 2 feet of a travel lane. For work on shoulders that must intrude upon the above area, signs, protective vehicles and/or flaggers may be required as called for in the Work Zone Cases listed and for short term encroachments (see page 45)

2) Roadside and some bridge work can usually be conducted sufficiently removed from traffic. The use of vehicle lights as shown on page 7 will be all that is needed. The Case Numbers shown should be reviewed to determine if they apply.
3) The index guides for work zone case number selection show most typical applications for each work activity, but may not be all inclusive. Other appropriate work zone cases or Design Standards may be utilized if the work site situations are applicable.

4) When an activity does not have a case number: a) Either the work is more than 15 feet off of the roadway or more than 2 feet beyond curb; b) A case must be selected which applies; c) A special detail must be developed.

5) Special work requires special attention. Work activities that are not conducted under normal conditions and work activities at locations that require special considerations should be planned in advance of the time workers are scheduled to make the repairs. Each worker and supervisor should be alert for any circumstance which would require change. Major deviations from the Case Number selection index should be with the approval of the supervisor.
<table>
<thead>
<tr>
<th>Code</th>
<th>Pavement Work Activity</th>
<th>2-lane 2-way</th>
<th>Multilane</th>
<th>Intersection</th>
</tr>
</thead>
<tbody>
<tr>
<td>410</td>
<td>Pothole Patching</td>
<td>20,21,22,30</td>
<td>7b,40,41,42,46,46A,48,63,64,65,66</td>
<td>92,93</td>
</tr>
<tr>
<td>411</td>
<td>Partial Depth Patching</td>
<td>20,21,22</td>
<td>40,41,42,44,50,51,64,65,66</td>
<td>92,93</td>
</tr>
<tr>
<td>412</td>
<td>Full Depth Patching</td>
<td>20,21</td>
<td>40,41,42,44,50,51,64,65,66</td>
<td>92,93</td>
</tr>
<tr>
<td>413</td>
<td>Bituminous Overlay</td>
<td>20,22</td>
<td>41,42,44,50,51,64,65,66</td>
<td>92,93</td>
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<tr>
<td>414</td>
<td>C.R.C. Pavement Patching</td>
<td>21</td>
<td>41,42,44,50,51,64,65,66</td>
<td>92,93</td>
</tr>
<tr>
<td>415</td>
<td>Bump Burning or Planing</td>
<td>20,21,22</td>
<td>40,46,46A,47,48,49,63,64,65,66</td>
<td>92,93</td>
</tr>
<tr>
<td>416</td>
<td>Crack &amp; Joint Sealing - Hand Poured</td>
<td>20,22</td>
<td>40,46,46A,47,48,49,63,64,65,66</td>
<td>92,93</td>
</tr>
<tr>
<td>417</td>
<td>Sealing or Skin Patching</td>
<td>20,22</td>
<td>40,46,46A,47,48,49,63,64,65,66</td>
<td>92,93</td>
</tr>
<tr>
<td>510</td>
<td>Pothole Patching - Liquid Asphalt &amp; Chips</td>
<td>20,21,22</td>
<td>40,46,46A,48,49,50,63,64,65,66</td>
<td>92,93</td>
</tr>
<tr>
<td>516</td>
<td>Crack &amp; Joint Routing</td>
<td>20,22</td>
<td>40,46,46A,48,49,50,63,64,65,66</td>
<td>92,93</td>
</tr>
<tr>
<td>517</td>
<td>Crk &amp; Jt Clean &amp; Seal with Rubzd Asphalt</td>
<td>20,22</td>
<td>40,46,46A,48,49,50,63,64,65,66</td>
<td>92,93</td>
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## Index Guide for Work Zone Case No. Selection

<table>
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<th>Work Activity Shoulders &amp; Side Approaches</th>
<th>2-lane 2-way</th>
<th>Multilane</th>
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<tr>
<td>420</td>
<td>Patch &amp; Repair Paved Shoulders</td>
<td>4,5,6,7a,22</td>
<td>4,5,6,7b,40,41,63</td>
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<td>421</td>
<td>Add and Spread Aggregate - Hand</td>
<td>4,5,6,7a,24</td>
<td>4,5,6,7b,63</td>
</tr>
<tr>
<td>422</td>
<td>Add and Spread Aggregate - Machine</td>
<td>5,7a,22,24</td>
<td>5,7b,63</td>
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<td>423</td>
<td>Sealcoat Application</td>
<td>5,7a,22,24</td>
<td>5,7b,63</td>
</tr>
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<td>424</td>
<td>Cutting High Shoulders</td>
<td>5,7a,22,24</td>
<td>5,7b,63</td>
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<td>425</td>
<td>Blading and Dragging</td>
<td>5,7a,22,24</td>
<td>5,7b,63</td>
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<td>426</td>
<td>Shoulder Wedging</td>
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## Index Guide for Work Zone Case No. Selection

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<td>430</td>
<td>Repairing Earth Slopes</td>
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<td>Ditches - Hand</td>
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<td>3,4,6,7b,40,41,42,64,65,66</td>
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<td>433</td>
<td>Inlet, Manhole &amp; Catch Basin Cleaning</td>
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<td>4,6,7b,63,64,65,66</td>
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<td>434</td>
<td>Inlet, Manhole &amp; Catch Basin Repair</td>
<td>3,4,6,20,21</td>
<td>3,4,6,40,41,42,64,65,66</td>
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<td>435</td>
<td>Sewer Line, Pipe &amp; Culvert Cleaning</td>
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<td>3,4,6,7b,40,41,42,63,64,65,66</td>
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<td>Underdrain Maintenance</td>
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<td>Code</td>
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<td>Multilane</td>
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<td>------</td>
<td>---------------------------------------------------</td>
<td>--------------</td>
<td>-----------</td>
<td>--------------</td>
</tr>
<tr>
<td>440</td>
<td>Tree, Brush &amp; Shrub Removal</td>
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<td>Mowing - Machine</td>
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<td>Area Vegetation Spraying</td>
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<td>Strip Vegetation Spraying</td>
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<td>446</td>
<td>Mechanical Sweeping</td>
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<td>Litter Pickup</td>
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<td>553</td>
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<td>(Exc. Actv. 653 and 654)</td>
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<td>755</td>
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<td>756</td>
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<th>Intersection</th>
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<td>Attenuator Maintenance</td>
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<td>466</td>
<td>Advertising Sign Removal</td>
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<td>Delineator Maintenance</td>
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<th>Work Activity Traffic Duties</th>
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<tr>
<td>200</td>
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<td>220</td>
<td>Center / Lane Striping</td>
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<td>Edge Line Striping</td>
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<td>Simultane Striping</td>
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<td>Spec Pvmt Marking</td>
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<td>Rd / Cb Marker Maint</td>
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<td>Flash Beacon Maint</td>
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<td>Delineator Maint</td>
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<td>468</td>
<td>Sign &amp; Traffic Activity</td>
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</table>
Emergency
Call Outs
Traffic Control Plan For Emergency Call Outs

Call outs for emergency operations may vary from potholes, down power lines, trees, blowups, to accidents. When the nature or extent of the call out is not known, the following information should be considered in calling out equipment and manpower.

1) Multilane, primary, or secondary system.
2) Traffic Volume.
3) Time of day.
4) Is police backup available?

If the situation can be safely cleared within 60 minutes, it should be done. If after arriving at the scene of a call out, it is determined that more than 60 minutes will be required:

1) Arrangements shall be made immediately to get additional traffic control to project.
2) Until additional traffic control arrives, work under emergency case to protect motorists and to direct traffic.
Using Fusees Safely and Effectively

Fusees are effective for emergency warning at accident scenes and other hazardous locations. Be aware of the following:

A) Fusees have a limited burning time; therefore, if an emergency exists beyond the burning time of the fusees additional fusees must either be reset or be replaced with reflectorized cones, drums or barricades.

B) The molten sulfur from a burning fusee is quite hazardous; therefore, extreme care must be taken when handling a lit fusee.

C) To minimize the possibility of fire and / or explosion, never place lit fusees near the vehicles at an accident scene or other flammable materials.
FIRST RESPONSE
ALL SPEEDS
2 LANE - 2 WAY
NIGHT SHORT TIME OPERATIONS
AND EMERGENCY CALL OUT

Note:
Cones at 20 ft. centers
on taper and at 50 ft.
centers along travel way.

1. First worker to respond:
   a) Handles situation within 60 minutes,
      as per page 45.
   or:
      b) Radios for help, sets up fusees/cones
         and flags as a single flagger, page 23.

2. Second worker to arrive,
   sets up an approved case.
Increase advance warning for restricted sight distance such as curves and hills.

Flagger (when available)

Reflectorized cones or Fusee (↑) for night work.

Flagger station illuminated by head lights or equivalent means.

GENERAL NOTES

1. All vehicles with amber rotating warning or strobe warning lights in operation.
2. Arrow Board in CAUTION mode optional.
3. Approved protective clothing shall be used for night work.
4. Reflectorized cones or Fusees are required for night work longer than 15 minutes.
5. When lane closure is to be in place for more than 2 hours, a full lane closure should be installed. Inform District dispatcher or Station 1 of situation.
First Response: Handle situation per page 45, if possible.

1. Call for additional devices/help.
2. Set up fusees and/or reflectorized cones.
3. Position vehicle to warn traffic.
4. Aid situation as possible, as a flagger protect hazard.
GENERAL NOTES

1. All vehicles with amber rotating warning or strobe warning lights in operation.
2. If >2’ off shoulder, vehicle to set on shoulder with strobe lights on.
3. Approved protective clothing shall be used for night work.
4. Reflecterized cones or fusees are required after 15 minutes.
5. When lane closure is to be in place for more than 2 hours, a full lane closure should be installed. Inform District Dispatcher or Station One of situation.
Short Term Encroachment
Short Term Encroachments on Pavement:

A. No attempts shall be made to stop, slow, or direct traffic into another lane except by properly equipped flagger with proper warning signs in place. In an emergency, signs may be installed after the initial response and more crews arrive.

B. May be performed without a flagger, provided all vehicles are completely off traveled lanes.
   1. Each task must be performed with extreme care.
   2. The amount of time the workers are on the pavement shall be minimized.
   3. Workers shall enter onto the pavement only during appropriate gaps in traffic.
   4. If workers must remain in traffic lane and appropriate gaps do not exist, the lane must be closed with proper traffic control signs and devices.
   5. Vehicle shall be as far off the edge of pavement as possible.
   6. When possible, work on the same side of road as the vehicle.
   7. Employee shall wear approved high visibility outer wear. Vehicle shall have its strobe light on.
   8. Multi-lane roadways; at slow speeds, drive on shoulder with strobe lights on.

C. This provision does not apply to pavement pothole or bridge deck patching.

D. When it is necessary for vehicle to stop on the roadway, traffic control shall be in accordance with the proper case.

E. Full lane closure should be considered when work at one location would exceed one hour.
Shoulders
ALL SPEEDS
TWO-LANE & MULTILANE
SHOULDER WORK WITH
MINOR ENCROACHMENT
60 MINUTES OR LESS
SIGHT DISTANCE OF 1000’ TO
APPROACHING TRAFFIC REQUIRED

WZ 03
DAY AND NIGHT

When workers encroach onto roadway, a protective vehicle is required (see page 14). All vehicles shall operate strobe lights.

THIS CASE IS ONLY ALLOWED DURING NON-PEAK TRAFFIC.
ALL SPEEDS
TWO-LANE AND MULTILANE
LESS THAN 60 MINUTES
SHOULDER WORK

* Taper varies
(see Table)

* Cones on pavement edge
≤45 mph - 40' ctrs.
Cones on 20' centers
≥50 mph - 80' ctrs.
(min. of 3)

Optional

-100' min. to workers
All vehicles operating strobe lights.

* Cones required when work is within 2' of pavement.

TABLE OF TAPER LENGTHS (FT.)

<table>
<thead>
<tr>
<th>SPEED</th>
<th>SHOULDER WIDTH (FT.)</th>
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</table>
INTERMITTENT MOVING OPERATION
SHOULDER WORK

SHOULDER

Flashing Arrow Board (CAUTION Mode)

SHOULDER

TMA is required when truck encroaches onto roadway.

200’-1500’

All vehicles operating strobe lights.
ALL SPEEDS
TWO-LANE AND MULTILANE
60 MINUTES OR MORE
SHOULDER WORK

For work more than 2 hours
an Arrow board is required.

---

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<tr>
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<th>4</th>
<th>6</th>
<th>8</th>
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<tr>
<td>500’</td>
</tr>
<tr>
<td>350’</td>
</tr>
<tr>
<td>100’</td>
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</table>

---

If work area is >15’ from
pavement edge, no signs are
required.

---

These are minimum dimensions
to be increased if needed to
fit field conditions.

---

See Table
Arrow board in CAUTION mode, required when sight distance is not available.

* Cones on 20’ ctrs.  
* Cones on pavement edge
  ≤45 mph - 40’ ctrs.
  ≥50 mph - 80’ ctrs.
  (min. of 3)

Optional

Arrow board in CAUTION mode optional

WZ AREA

See Table

All vehicles operating strobe lights.

* Cones required when working within 2 ft. of pavement.

Signs required on both sides of multiline divided highway when median is > 10’.
ALL SPEEDS
2 LANE 2 WAY
OFF ROAD MOVING OPERATION
NO TIME LIMIT

ROAD WORK AHEAD

MOWING AHEAD

* May be used for maintenance mowing operations
If work area is more than 15 ft. from pavement edge, no signs are required.

WORK AREA

See note

A

B

See table

WORK AREA

Note:
Minimum distance is A from table at the Start of the Operation. Maximum distance is not to exceed one half the length required for one normal day’s operation (4 miles maximum).

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<th>SPEED</th>
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<tbody>
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<td>MPH</td>
<td>LENGTH</td>
</tr>
<tr>
<td>55</td>
<td>500’</td>
</tr>
<tr>
<td>45-50</td>
<td>350’</td>
</tr>
<tr>
<td>&lt;40</td>
<td>100’</td>
</tr>
</tbody>
</table>
ALL SPEEDS
MULTILANE
OFF ROAD MOVING OPERATION
NO TIME LIMIT

MEDIAN

Signs in Median may be omitted when median is less than 10 ft. wide.

ROAD WORK AHEAD

MOWING AHEAD

May be used for maintenance mowing operations

See Table

See Note
WORK AREA

See Note

WORK AREA

See Table

Do not work on both sides of the road simultaneously.

MEDIAN

TABLE OF SIGN SPACING

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>LENGTH A</th>
<th>LENGTH B</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>1,000'</td>
<td>1600'</td>
</tr>
<tr>
<td>55-60</td>
<td>500'</td>
<td>500'</td>
</tr>
<tr>
<td>45-50</td>
<td>350'</td>
<td>350'</td>
</tr>
<tr>
<td>≤40</td>
<td>100'</td>
<td>100'</td>
</tr>
</tbody>
</table>

Note:

1. Minimum distance is A from table at the Start of the Operation. Maximum distance is not to exceed one half the length required for one normal day’s operation (4 miles maximum).
2. No Advance Warning Signs are required in opposite direction if work is on outside shoulder only.

If work area is more than 15 ft. from pavement edge, no signs are required.
2-Lane 2-Way
ALL SPEEDS
LESS THAN 60 MINUTES

Cone placement:
- Cones along centerline
- 100' min.
- <45 mph - 40' ctrs.
- ≥50 mph - 80' ctrs.

Flagger placement:
- WORK AREA is between the centerline and 2' outside of the pavement edge.

Notes:
- Cones required after 30 minutes.
- All vehicles operating strobe lights.
- Adequate sight distance of 1000' required otherwise utilize CASE WZ-21.
ALL SPEEDS
NON-MOVING OPERATION
NO TIME LIMIT

Cones on centerline
≤45 mph - 40’ ctrs.
≥50 mph - 80’ ctrs.
(min. of 3)

Cones on 20’ centers

See Table

See Table

See Table

100’

Taper

ROAD WORK AHEAD

ONE LANE ROAD AHEAD

FLAGGER
Within 2 ft. of roadway

TABLE OF SIGN SPACING

<table>
<thead>
<tr>
<th>SPEED</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>500'</td>
</tr>
<tr>
<td>45-50</td>
<td>350'</td>
</tr>
<tr>
<td>≤40</td>
<td>100'</td>
</tr>
</tbody>
</table>
Flaggers used for moving operations are dependent on the travel speed. If the work operation moves too fast for flaggers, the flaggers may be omitted and the FLAGGER signs shall be replaced with WORKER signs. In lieu of flaggers, a protective vehicle with a TMA and an arrow board in CAUTION mode shall be used in advance of the work area.

If work operation exceeds 2 miles per 1/2 day, utilize detail WZ24.

All vehicles operating strobe lights.
See Flagger Handbook for flagger instructions and requirements.

NOTE:
Minimum distance is 200 ft. at Start of Operation. Maximum distance is 2 miles but in no case to exceed one half the distance required for one normal day's operations, whichever is less.

<table>
<thead>
<tr>
<th>SPEED</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>500'</td>
</tr>
<tr>
<td>45-50</td>
<td>350'</td>
</tr>
<tr>
<td>≤40</td>
<td>100'</td>
</tr>
</tbody>
</table>
MINIMUM TRAFFIC CONTROL STRIPING

- KEEP RIGHT
- WET PAINT or WET PAINT
- KEEP RIGHT
- WET PAINT or WET PAINT

Flag (on guide)

200' min. See Note 2.

Arrowboard in CAUTION mode.
Notes:

1. Striping machine and all vehicles in convoy (except law enforcement vehicles) are to have headlights operating and are to display amber colored oscillating, rotating, flashing, or strobe lights. At least one amber light is to be visible from any direction.

2. The distance trailing vehicles follow the striping machine will vary depending on the terrain and susceptibility of the painted line to wheel tracking. Whenever adequate stopping sight distance exists to rear, the protection vehicle shall maintain minimal distance. The protection vehicle should slow down in advance of vertical and horizontal curves that restrict sight distance.

3. Striping operation may be supported by additional traffic control devices.
ALL SPEEDS
INTERMITTENT /MOVING OPERATION
TWO–LANE, TWO–WAY TRAFFIC

Flaggers use for moving operations is dependent on the travel speed.
If the work operation moves too fast for flaggers, the flaggers may be
omitted and the FLAGGER signs shall be replaced with WORKER signs. In lieu
of flaggers, a protective vehicle with a TMA and an arrow board in CAUTION
mode shall be used in advance of the work area.

Protective vehicle with
arrowboard in CAUTION mode.

Flagger

Varies to permit visibility

Truck completely on shoulder.

All vehicles operating strobe lights.

Shoulder sign truck in radio communication
with protective vehicle to provide proper
distance to provide advance warning.
Required when visibility is not adequate.

100' min.
Flagger

100' to workers

WORK AREA

100' min.

WZ 24
DAY OR NIGHT

ONE LANE ROAD AHEAD

65
ALL SPEEDS
INTERMITTENT POTHOLE PATCHING
2 LANE ROADWAY
LESS THAN 5,000 ADT

All vehicles operating strobe lights.
A. May be performed without a flagger, provided all vehicles are completely off traveled lanes:

1. Each task must be performed with extreme care.
2. The amount of time the workers are on the pavement shall be minimized.
3. Workers shall enter onto the pavement only during appropriate gaps in traffic.
4. Adequate sight distance must be available to utilize this case.
5. If workers must remain in traffic lane and appropriate gaps do not exist, the lane must be closed with proper traffic control signs and devices.
6. Vehicle may not encroach onto the pavement.
7. When possible, work on the same side of road as the vehicle.
8. Employee shall wear approved high visibility outer wear and hat.
9. Vehicle shall have its strobe lights on.

B. No attempts shall be made to stop, slow, or direct traffic into another lane except by a properly equipped flagger with proper warning signs in place.

C. When it is necessary for the vehicle to stop on the roadway, traffic control shall be in accordance with the proper case.

D. This case is only allowed during non-peak traffic.
Multilanes
ALL SPEEDS
MULTILANE
UP TO 60 MINUTES

Less than 15 minutes, both trailing truck and signs optional. 15 to 60 minutes, either trailing truck or signs shall be utilized.

For left lane closure use corresponding left lane information. If median ≥ 10 ft., signs are required in median.

### TABLE OF SIGN SPACING

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>LENGTH A</th>
<th>LENGTH B</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>1000'</td>
<td>1600'</td>
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<tr>
<td>55-60</td>
<td>500'</td>
<td>500'</td>
</tr>
<tr>
<td>45-50</td>
<td>350'</td>
<td>350'</td>
</tr>
<tr>
<td>≤40</td>
<td>100'</td>
<td>100'</td>
</tr>
</tbody>
</table>

Arrowboard in ARROW mode

** TMA is required when truck encroaches onto roadway.

* Vehicles operating strobe lights and arrow board.
MULTILANE
Less than or equal to 55 mph
ONE LANE CLOSURE
No Time Limit

When protective vehicle is moved forward to protect workers, an arrow board shall be placed at the start of the taper.

Protective vehicle with arrow board in ARROW mode, minimum of 100’ to workers.

Signs not required in median when median is less than 10’ wide.

Arrow Board in Arrow Mode

See Taper Table

† Directional indicator barricades at 50’ centers.

* Use existing or a reduced speed limit as may be needed, up to 10 m.p.h. less than posted.

For maintenance and utility projects

ROAD WORK 1 MILE

RIGHT LANE CLOSED 1/2 MILE

2600’

500’

1100’

1000’

500’
Add these signs when work is being performed in the left lane for an undivided highway.

The opposing inside lane should be closed when work is within 2’ of the centerline.

All vehicles operating strobe lights.

When work is being performed in the left lane, corresponding left lane information shall be used.

Cones at 50’ centers.

When drums or barricades are used, the 50’ spacing may be doubled.
INTERSTATE
ONE LANE CLOSURE
NO TIME LIMIT
ANY SPEED

The first 2 signs and message board are stationary.

1. The Road Work Ahead sign shall be located 3 to 5 miles in advance of the project limits.
2. The message and size of the Work Zone Public Information sign shall be as specified by the Bureau of Operations.
3. The message board shall be used to display status of lane within the project. The primary message shall be: “Right Lane Closed”/“X Miles Ahead” “Left Lane Closed”/“X Miles Ahead” “All Lanes Open”

Signs not required in median when median is less than 10’ wide.

4. Three, Type II barricades, drums, or vertical barricades at 15 m (50’) centers.
5. Signs 1, 2, and 3 are optional unless the lane closure(s) last(s) overnight or traffic backups are anticipated.
6. If signs 1, 2, and 3 are not used, replace the RIGHT LANE CLOSED 1 MILE with ROAD WORK AHEAD sign.
Work Zone speed limit 45 signs shall be moved as necessary to maintain the required spacing between the signs and the workers in each separate work activity.

Protective vehicle with arrow board in ARROW mode.

When protective vehicle is moved forward to protect workers, an arrow board shall be placed at the start of the taper.

100' Minimum

TMA - 100' minimum to workers.

Cones at 50' centers

1500' 1000' 500'

Direction indicator barricades at 50' centers.

All vehicles operating strobe lights.

55 MPH sign omitted when within 500ft of End Work Zone Speed Limit sign.

When work is being performed in the left lane, corresponding left lane information shall be used.
MULTILANE DIVIDED
TWO LANE CLOSURE
NO TIME LIMIT

The Road Work Ahead sign shall be located 3 to 5 miles in advance of the project limits.
2. The message and size of the Work Zone Public Information sign shall be as specified by the Bureau of Operations.
3. The message board shall be used to display status of lane within the project. The primary message shall be:
   “Right 2 Lanes Closed”/“X Miles Ahead”
   “Left 2 Lanes Closed”/“X Miles Ahead”
   “All Lanes Open”

Signs not required in median when median is less than 10’ wide.

1. ROAD WORK AHEAD
2. Work Zone Public Information Sign
3. Right Two Lanes Closed 1 Mile
4. Arrow Board in Arrow Mode

Three Type II barricades, drums, or vertical barricades at 15 m (50’) centers.
5. Signs 1, 2, and 3 are optional unless the lane closure(s) last(s) overnight or traffic backups are anticipated.
6. Use existing or a reduced speed limit as may be needed, up to 10 m.p.h., less than posted but not less than 45 mph with the Operations Engineer Approval.

7. If signs 1, 2, and 3 are not used, replace the RIGHT TWO LANES CLOSED 1 MILE with ROAD WORK AHEAD sign.
ALL SPEEDS CENTER LANE CLOSURE NO WORKERS PRESENT

1. The Road Work Ahead sign shall be located 3 to 5 miles in advance of the project limits.
2. The message and size of the Work Zone Public Information sign shall be as specified by the Bureau of Operations.
3. The message board shall be used to display status of lane within the project. The primary message shall be:
   "Right Lane Closed"/"X Miles Ahead"
   "Left Lane Closed"/"X Miles Ahead"
   "All Lanes Open"

The first 2 signs and message board are stationary.

4. Three, Type II barricades, drums, or vertical barricades at 15 m (50') centers.

*Distance of 500' or B/2, whichever is less.

Flashing Arrow Board
In ARROW mode
(When median is ≥ 20' wide)

*Use existing or a reduced speed limit as may be needed, up to 10 m.p.h. less than posted but not less than 45 mph with the Operations Engineer Approval.
**Flash Gordon Board**

In ARROW mode (When median is ≥ 20’ wide)

- [Centerlane Closed Area]

---

**TABLE OF SIGN SPACING**

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>LENGTH A</th>
<th>LENGTH B</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>1,000’</td>
<td>—</td>
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<tr>
<td>55-60</td>
<td>500’</td>
<td>500’</td>
</tr>
<tr>
<td>45-50</td>
<td>350’</td>
<td>350’</td>
</tr>
<tr>
<td>≤40</td>
<td>100’</td>
<td>100’</td>
</tr>
</tbody>
</table>

---

**A**

Notes:
- Cones on taper:
  - ≤45 mph - 20’ ctrs.
  - ≥50 mph - 40’ ctrs.
- Cones on lane lines:
  - ≤45 mph - 40’ ctrs.
  - ≥50 mph - 80’ ctrs.

---

**TABLE OF TAPER LENGTHS**

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>LENGTH L</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>1000’</td>
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<tr>
<td>55</td>
<td>660’</td>
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<td>45</td>
<td>540’</td>
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<tr>
<td>40</td>
<td>320’</td>
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<tr>
<td>35</td>
<td>245’</td>
</tr>
<tr>
<td>30</td>
<td>180’</td>
</tr>
</tbody>
</table>

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*Note: This case may only be utilized when workers are not present.*

---

Use WZ 44 while workers are present.
ALL SPEEDS
INTERMITTENT / MOVING OPERATION
NO TIME LIMIT
MORE THAN 4 MILE PER DAY

If work production < 4 mile/day, WZ48 must be utilized.

TMA is required when truck encroaches onto roadway.

Note: On roadways with ADT < 25,000, all vehicles can travel on shoulder, then move into the traffic lane for intermittent operations such as pothole patching.
ALL SPEEDS
INTERMITTENT / MOVING OPERATION
NO TIME LIMIT
MORE THAN 4 MILE PER DAY

If work production < 4 mile/day, WZ48 must be utilized.

Note: On roadways with ADT < 25,000, all vehicles can travel on shoulder, then move into the traffic lane for intermittent operations such as pothole patching.
45 MPH OR LESS
INTERMITTENT / MOVING OPERATION
WITH CURB AND GUTTER
ONE LANE CLOSURE

Curb & Gutter

Arrow board in ARROW mode

100’ min.

Curb & Gutter

All vehicles operating strobe lights.
ALL SPEEDS
INTERMITTENT / MOVING OPERATION
NO TIME LIMIT
LESS THAN 4 MILE PER DAY

Flashing Arrow board in ARROW mode
All vehicles operating strobe lights

TMA is required when truck encroaches onto roadway,

Varies
See Note

Maintain 600 ft. Minimum

Optional
Note: Minimum distance is 200 ft. at start of operation. Maximum distance is two miles, but in no case to exceed one half the length required for one normal day’s operation.

Signs not required in median when median less than 10 ft. wide.

For left lane closure use corresponding left lane signage.

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>LENGTH A</th>
<th>LENGTH B</th>
<th>LENGTH C</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>1,000’</td>
<td>1,600’</td>
<td>2,600’</td>
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<tr>
<td>55-60</td>
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<tr>
<td>45-50</td>
<td>350’</td>
<td>350’</td>
<td>350’</td>
</tr>
<tr>
<td>≤40</td>
<td>100’</td>
<td>100’</td>
<td>100’</td>
</tr>
</tbody>
</table>
INTERMITTENT / MOVING OPERATION
TWO LANE CLOSURE

Flashing Arrow board in ARROW mode.

TMA is required when truck encroaches onto roadway.

500' - 1500'
Maintain 600' minimum

Protective vehicle optional

All vehicles operating strobe lights.
45 MPH OR LESS
CENTER LANE USED AS
THRU LANE
NO TIME LIMIT
UP TO 60 MINUTES, NO SIGNS REQUIRED
FOR MORE THAN 60 MINUTES, SIGNS REQUIRED

Cones on lane lines at 20’ centers

Cone on 20’ centers in taper areas

See Taper Table

100’

Protective vehicle with arrowboard in ARROW mode

ROAD WORK AHEAD

RIGHT LANE CLOSED AHEAD

0r
All vehicles operating strobe lights

**Taper Table Length**

<table>
<thead>
<tr>
<th>Speed</th>
<th>Length</th>
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</thead>
<tbody>
<tr>
<td>45</td>
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<tr>
<td>35</td>
<td>125'</td>
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<tr>
<td>30</td>
<td>90'</td>
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**Sign Spacing**

<table>
<thead>
<tr>
<th>Speed</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>350'</td>
</tr>
<tr>
<td>≤40</td>
<td>100'</td>
</tr>
</tbody>
</table>
45 MPH OR LESS
CENTER LANE CLOSURE
NO TIME LIMIT
UP TO 60 MINUTES, NO SIGNS REQUIRED
FOR MORE THAN 60 MINUTES, SIGNS REQUIRED

Cones on lane lines at 20' centers

CENTER TURN LANE

Cones on 20' centers in taper area

3 Cones

100'

Buffer Varies
See Table A

ROAD WORK AHEAD
CENTER LANE CLOSED AHEAD

88
If operational problems are evident and caused by left-turning vehicles, the R3-9b signs in the immediate area of the work-zone should be temporarily covered and/or adjustments made in the lengths of the work area, buffer areas and tapers. All dimensions shown may be increased.

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>BUFFER LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>220'</td>
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<tr>
<td>40</td>
<td>170'</td>
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<tr>
<td>35</td>
<td>120'</td>
</tr>
<tr>
<td>30</td>
<td>85'</td>
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</tbody>
</table>

**Sign Spacing**

<table>
<thead>
<tr>
<th>Speed</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>350'</td>
</tr>
<tr>
<td>&lt;40</td>
<td>100'</td>
</tr>
</tbody>
</table>
ALL SPEEDS
MULTILANE MOVING OPERATION

Optional:
TMA required when truck encroaches onto roadway.

RIGHT LANE CLOSED AHEAD (Optional)

Arrowboard in ARROW mode

Optional vehicle
Trailing vehicle shall be equipped with a truck mounted attenuator.

TMA

500' (variable)

Distance
See Note 2.

Flag (on guide)

WET PAINT or WET PAINT

PASS WITH CARE

SHOULDER

Appropriate rear corner and arrow
Notes:

1. Striping machine and all vehicles in convoy (except law enforcement vehicles) are to have headlights operating and are to display an amber colored oscillating, rotating, flashing or strobe lights. At least one amber light is to be visible from any direction.

2. Distance trailing vehicle(s) follows striping machine will vary depending on terrain and susceptibility of painted line to wheel tracking, whenever adequate stopping sight distance exists to rear, the protection vehicle shall maintain minimal distance. The protection vehicle should slow down in advance of vertical and horizontal curves that restrict sight distance.

3. Striping operation may be supported by additional traffic control devices.

4. Use WET PAINT and PASS WITH CARE signs on striping operations.

5. On curb and gutter sections, truck on shoulder is not required.
Ramps
RAMP WORK OF SHORT DURATION
INTERMEDIATE TYPE WORK
UP TO 60 MINUTES

All vehicles operating strobe lights.

This case can be utilized for either side of ramp.

Protective vehicle with arrow board in CAUTION mode.

TMA required when truck encroaches onto roadway.

WORK AREA

100' min.

10' min.
All vehicles operating strobe lights.

<table>
<thead>
<tr>
<th>SPEED</th>
<th>LENGTH A</th>
<th>LENGTH B</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>1,000'</td>
<td>1,600'</td>
</tr>
<tr>
<td>55-60</td>
<td>500'</td>
<td>500'</td>
</tr>
<tr>
<td>45-50</td>
<td>350'</td>
<td>350'</td>
</tr>
<tr>
<td>≤40</td>
<td>100'</td>
<td>100'</td>
</tr>
</tbody>
</table>

Cones on 20' centers.

Protective vehicle with arrow board in CAUTION mode.

This case can be utilized for either side of ramp.
TYPICAL ENTRANCE RAMP APPLICATION

If room on ramp, space signs on ramp

Cones at 20' ctrs.
Protective vehicle,
Arrowboard in CAUTION mode

Dual display sign if
median more than 10' wide

Median

TABLE OF SIGN SPACING

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>LENGTH A</th>
<th>LENGTH B</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>500'</td>
<td>500'</td>
</tr>
<tr>
<td>45-50</td>
<td>350'</td>
<td>350'</td>
</tr>
<tr>
<td>≤40</td>
<td>100'</td>
<td>100'</td>
</tr>
</tbody>
</table>
Intersections
ALL SPEEDS
SIDEROAD WORK
TWO LANE, TWO WAY
15 MINUTES OR LESS

All vehicles operating stobe lights.

All cones are optional

100’ Taper
6 cones min.

Cone @ 20’ centers

Cone @ 20’ centers

Mainline

Sideroad

Flagger to hold traffic until work completed.

Provide additional flaggers on other legs of intersection if required to control traffic.
45 MPH OR LESS INTERSECTION NO TIME LIMIT

**TABLE OF SIGN SPACING**

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>350′</td>
</tr>
<tr>
<td>≤40</td>
<td>100′</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONES ON TAPER</th>
<th>CONES ON LANE LINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 45 mph - 20′ centers</td>
<td>≤ 45 mph - 40′ centers</td>
</tr>
<tr>
<td>≥ 50 mph - 40′ centers</td>
<td>≥ 50 mph - 80′ centers</td>
</tr>
</tbody>
</table>

Cones on 20′ centers in taper area

For work in advance of cross road, use signage of appropriate case.
TABLE OF TAPER LENGTHS

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>LENGTH</th>
<th>CONES</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>660'</td>
<td>34</td>
</tr>
<tr>
<td>50</td>
<td>600'</td>
<td>31</td>
</tr>
<tr>
<td>45</td>
<td>540'</td>
<td>22</td>
</tr>
<tr>
<td>40</td>
<td>320'</td>
<td>16</td>
</tr>
<tr>
<td>35</td>
<td>245'</td>
<td>14</td>
</tr>
<tr>
<td>30</td>
<td>180'</td>
<td>12</td>
</tr>
</tbody>
</table>

Note: When 150' space is available, place protective vehicle in advance of work area.

If work encroaches into side road, flagger and flagger signs are required.

Protective vehicle required for speeds > 40 mph.
ALL SPEEDS
MULTILANE DIVIDED
LEFT TURN LANE CLOSURE
NO TIME LIMIT

Use of a flagger and flagger sign is optional, depending on construction, traffic and roadway ADT.

Signs in median may be omitted when median is less than 10ft wide.

Cone spacing:
- \( \leq 45 \text{ mph} \): 40’ centers
- \( > 50 \text{ mph} \): 80’ centers

TABLE OF SIGN SPACING

<table>
<thead>
<tr>
<th>SPEED MPH</th>
<th>LENGTH A</th>
<th>LENGTH B</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>1,000’</td>
<td>1,600’</td>
</tr>
<tr>
<td>55</td>
<td>500’</td>
<td>500’</td>
</tr>
<tr>
<td>45-50</td>
<td>350’</td>
<td>350’</td>
</tr>
<tr>
<td>( \leq 40 )</td>
<td>100’</td>
<td>100’</td>
</tr>
</tbody>
</table>

* See Table of Sign Spacing
Required when work encroaches past the nose of the intersection.

If work encroaches into side road, flagger and flagger signs are required.

Required when work encroaches past the nose of the intersection.
Method of Operation:

1. Truck placed on pavement with strobe lights operating.
2. 28" Cones utilized, 6 for taper and 3 along side of track.
3a. Multilane - Place signals in flashing red or use protective vehicle as per WZ-40.
3b. 2-Lane - Place signals in flashing red or control traffic as per WZ-20.
ALL SPEEDS
TURN LANE CLOSURE
15 MINUTES OR LESS

Close turn lane when adequate cones are available.

When adequate cones are not available use a 100' taper.

Method of Operation:

1. Truck placed on pavement with strobe lights operating.
2. 28” cones placed around work area.
3. If median is painted, cones shall be placed on all sides of work area.
Miscellaneous
ALL SPEEDS
INTERMITTENT/MOVING OPERATIONS
WITH FREQUENT STOPS AND NO WORKERS OUT OF VEHICLE

Limited to:
Strip Vegetation Spraying, Power Brooming
at Bridges, Intersections and short distances

Work Area

All vehicles operating strobe lights.
Additional Cases
MOVING OPERATION FOR WORK AT ENTRANCE RAMP (15 MIN. AND LESS)

Close lane using WZ 46 or WZ 46A

Close ramp using truck, TMA & Arrow board in CAUTION mode. This vehicle should be on crossroad or ramp shoulder and move on to ramp, slowing and stopping traffic, when crew on mainline is ready to move into work area (radio communications required).
LANE CLOSURE
OFF RAMP
NO TIME LIMIT

Detail A
Exit sign may be
omitted for short
term operations
(15 minutes or less)

Close lane using WZ - 41

\(\uparrow\) Shift opening as required
to accommodate work area.

Cone & 20' center - Ramp
Cone & 40' center - Mainline
LANE CLOSURE ON RAMP NO TIME LIMIT

Close lane using WZ - 41

Cone @ 20' center - Ramp
Cone @ 40' center - Mainline

500' min.

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Shift opening as required to accommodate work area.
WEAVING AREA
CLOVERLEAF INTERCHANGE
NO TIME LIMIT

Cross Road

$\cdot$ Median

Close lane using WZ 41
On Ramp 500' min.
YIELD

ROAD WORK AHEAD

Cross Road

See DETAIL A

Off Ramp

Cones @ 20' center - Ramp
Cones @ 40' center - Mainline

DETAIL A
Exit sign may be omitted for short term operations (15 minutes or less)

① Shift opening as required to accommodate work area

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