
When an improved shoulder is closed on a high-speed roadway, it should be treated as a closure of a portion of the road system, since the motorist expects to be able to use it in an emergency. The work area on the shoulder should be closed off by a taper for channelizing devices. However, flashing arrow panels should not be used, except in the caution mode.

Minor Encroachment in Traveled Lane

When work is on the shoulder or takes up part of a lane, traffic volumes, type of traffic (buses, trucks and cars), speed, and capacity should be analyzed to determine whether the affected lane should be closed. Figure 11 illustrates a method for handling traffic where the work area encroaches slightly into the travel way. Conflicts with traffic will be reduced and additional protection provided by using a portable concrete barrier along the work area similar to Figure 12. For high-speed traffic conditions, a lane closure should be considered.

3. Work on Two-Lane Roadway

When one lane is closed on a two-lane, two-way road, the remaining lane must be used by traffic traveling in both directions. Figure 13 illustrates such a situation. The short two-way traffic taper (50 feet minimum) is used to slow traffic as it approaches the work space. Alternate one-way traffic control may be affected by the following means:

- Two flaggers, one at each end of the work area;
- One flagger can assign right-of-way at a short work area with low volumes;
- For very short work areas at a spot location where traffic volumes and speeds are very low, the movements may be self-regulating. This method is not satisfactory when the work area is near sharp hills and curves;
- A pilot car; and
- Temporary traffic signals for long-duration projects.

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR A MINOR ENCROACHMENT ONTO TRAFFIC LANE ON URBAN STREETS

NOTES:

1. Additional advance warning may be necessary.
2. At least 10 feet on urban streets should remain in the travel lane. If a greater encroachment is needed, close the lane.
3. Portable concrete barrier may be used along the work area.
4. For high speed traffic conditions, a lane closure should be considered.
5. A buffer space may be used.
6. Metric conversion:
500 ft.=150 m.
7. L=length of taper— refer to Table 2.

KEY:

	Pavement markings that should be removed for long term projects.
	Temporary markings to be placed as needed.

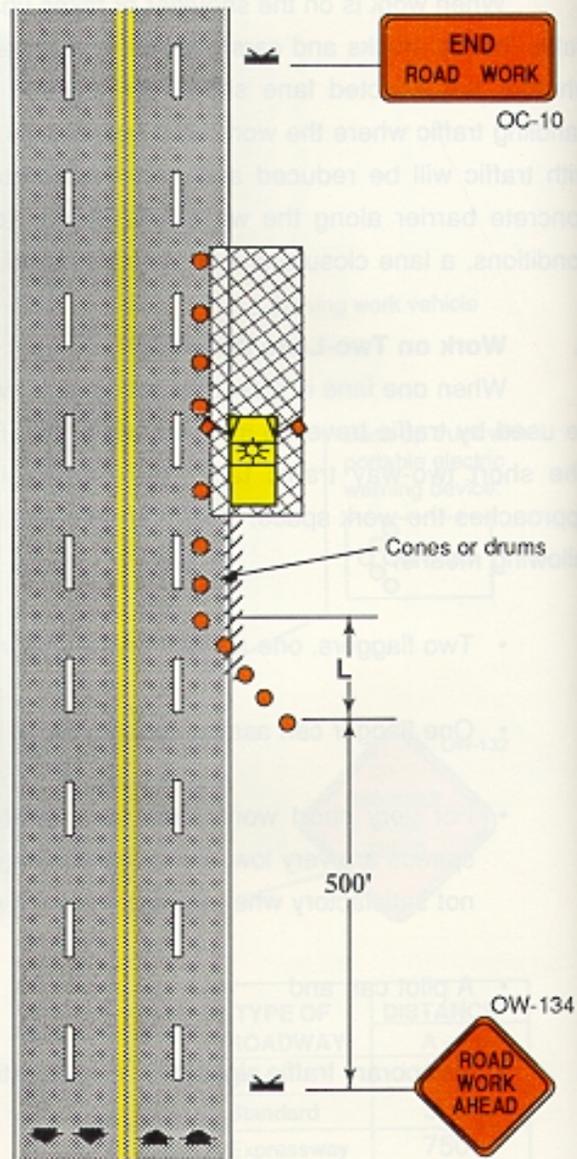


Figure 11

**TYPICAL APPLICATION OF
TRAFFIC CONTROL DEVICES
FOR
USING A PORTABLE BARRIER
AROUND A WORK AREA**

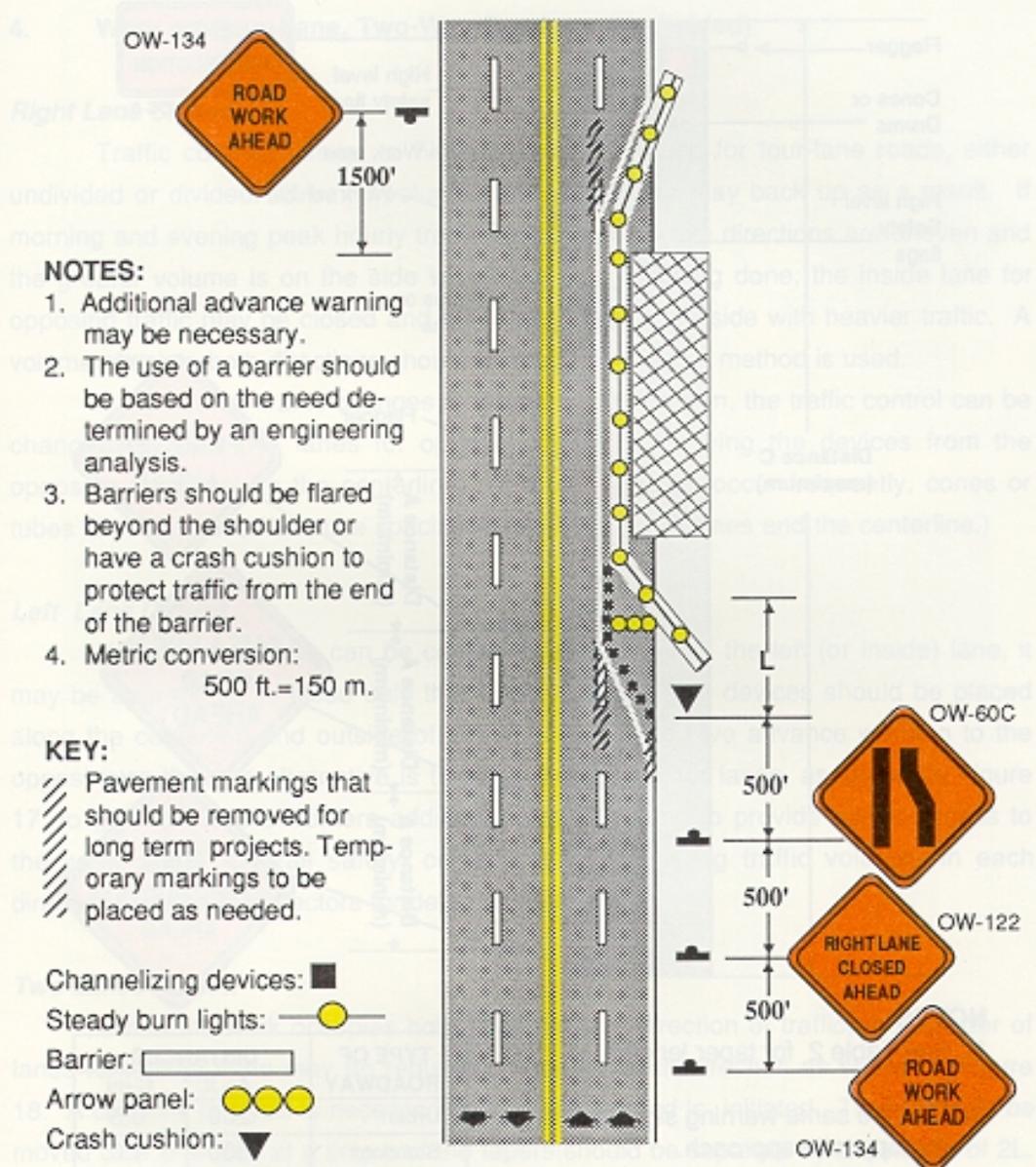
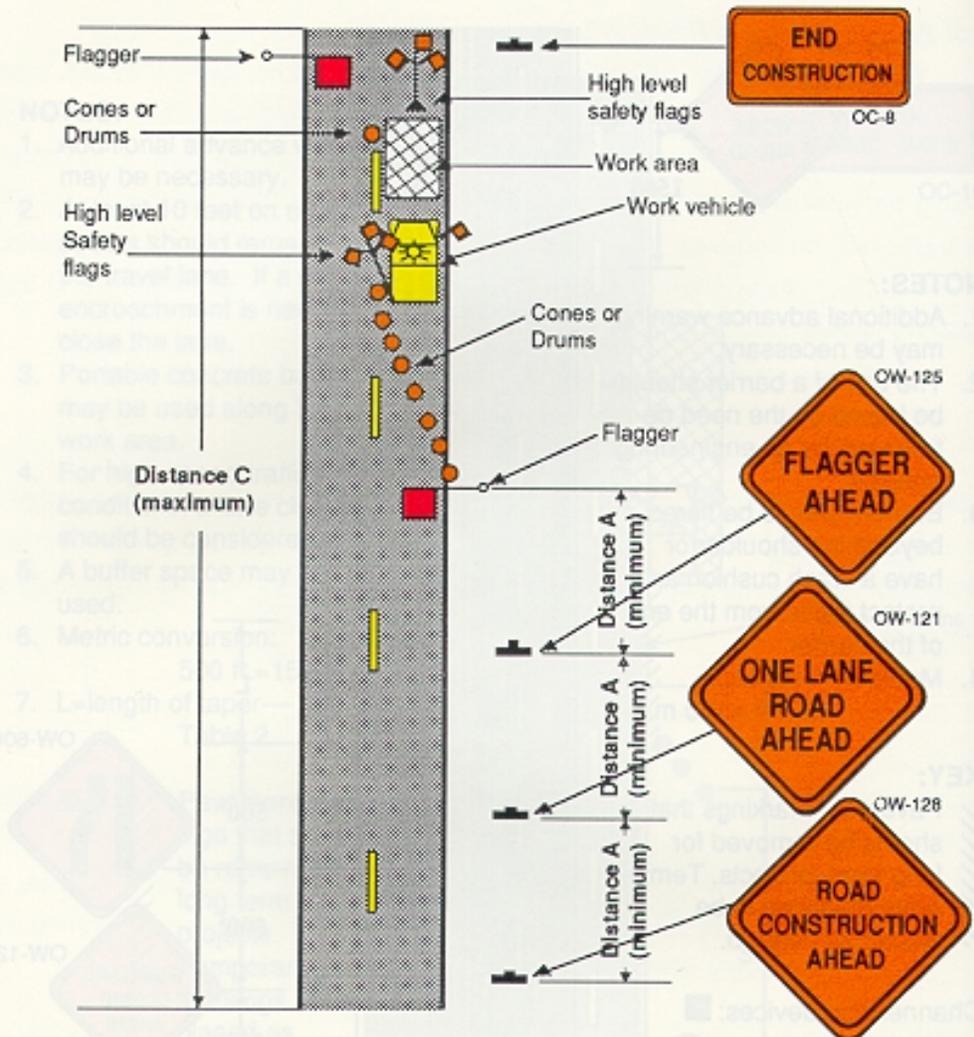


Figure 12

TYPICAL APPLICATION OF
 TRAFFIC CONTROL DEVICES
 FOR
**STATIONARY OPERATIONS
 IN ONE LANE**



NOTES:

1. See Table 2 for taper lengths.
2. Use the same warning signs on the opposite approach.

TYPE OF ROADWAY	DISTANCES	
	A - ft	C-mi
Urban	200	0.5
Standard	500	1.0

Figure 13

Curved Roadway and Hill

If the work area ends near the curve or hill, a flagger should be adjusted so that the flagger and the entire taper will be visible before the curve or hill for an adequate stopping sight distance. Figures 14 and 15 illustrate typical short-term flagging operations.

4. Work on Four-Lane, Two-Way Roadway (Undivided)

Right Lane Closed

Traffic controls similar to Figure 16 may be used for four-lane roads, either undivided or divided. If traffic volumes are high, traffic may back up as a result. If morning and evening peak hourly traffic volumes in the two directions are uneven and the greater volume is on the side where the work is being done, the inside lane for opposing traffic may be closed and made available to the side with heavier traffic. A volume check in both directions should be made before this method is used.

If the heavier traffic changes to the opposite direction, the traffic control can be changed to allow two lanes for opposing traffic by moving the devices from the opposing lane back to the centerline. (If these changes occur frequently, cones or tubes should be used at close spacing to emphasize lane lines and the centerline.)

Left Lane Closed

If the work activity can be contained entirely within the left (or inside) lane, it may be appropriate to close only that lane. Channelizing devices should be placed along the centerline and outside of the work activity to give advance warning to the opposing traffic. An alternative is to close the two center lanes, as shown in Figure 17, to give traffic and workers additional protection and to provide easier access to the work area. Overall safety, considered with existing traffic volumes in each direction, are the main factors for determining alternates.

Two Lanes Closed

When the work occupies both lanes for one direction of traffic, the number of lanes remaining open may be reduced to one for each direction as shown in Figure 18. A capacity analysis is necessary before this method is initiated. Traffic should be moved over one lane at a time and the tapers should be separate by a distance of 2L. When both center lanes are closed, traffic controls may be used as indicated in Figure 17.