

The **advance warning area** is where traffic is informed of an upcoming temporary traffic control zone. It may vary from a single sign or rotating/strobe lights on a vehicle to a series of signs depending on the duration, location, and type of work.

Recommended sign spacing in this area is shown in the following table.

Speed Limit (mph)	Sign Spacing ¹ (ft.)	
	Undivided Highway	Divided Highway
0-35	200	200
40-45	350	500
50-55	500	1000
60-70	1000	1000

¹ Sign spacing may be adjusted, normally by increasing it, to accommodate field conditions and visibility.

The **transition area** is where traffic is redirected out of their normal path and into the traffic space. This is usually accomplished through the use of a series of channelizers placed in a taper across the portion of roadway to be closed. There are three types of tapers - shoulder, lane, and one-lane, two-way.

The **shoulder taper** is used to close the shoulder where it is part of the activity area or when improved shoulders might be mistaken for a driving lane.

The **lane taper** is used to close a driving lane by forcing traffic to merge or shift.

Recommended taper length and channelizer spacing for shoulder and lane tapers in the transition area are shown in the following table.

Speed Limit (mph)	Taper Length ¹ (ft.)		Channelizer Spacing ⁴ (ft.)
	Shoulder ²	Lane ³	
0-35	70	245	35 ⁵
40-45	150	340	40 ⁵
50-55	185	660	50 ⁵
60-70	235	840	60 ⁵

- ¹ Taper lengths may be adjusted to accommodate crossroads, curves, intersections, ramps, or other geometric features.
- ² Based on 10 ft. shoulder width.
- ³ Based on 12 ft. lane width.
- ⁴ Channelizer spacing may be reduced to discourage traffic encroachment.
- ⁵ Spacing reduced to 1/2 at intersections.
- ⁶ Spacing may be reduced to 1/2 at intersections.

The **one-lane, two-way taper** is used to close one lane of a two-lane, undivided highway where the remaining lane is used alternately by traffic in each direction. The taper has a length of 100 feet (5 channelizers @ 20 foot spacing).

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Limit and REDUCED SPEED AHEAD signs are not shown on the typical applications.

- For speed reductions greater than ten mph, additional notification should be provided through the use of the REDUCED SPEED AHEAD sign.
- For speed reductions greater than 20 mph, the speed limit should be reduced in two stages.
- On divided highways, the reduced speed is applicable to the affected direction of travel only.
- Existing speed limit signs within the temporary traffic control zone shall be covered or removed.
- Speed limit signs indicating the normal speed limit should be installed at the end of the reduced area provided no other reduction is imposed within the next one-half mile or no existing speed limit sign is located within the next one-half mile.
- Reduced speed limit signing shall be removed, covered, or turned from traffic when conditions requiring the reduced speed no longer exist.
- A special activity within a temporary traffic control zone may require a lower speed limit than the one imposed for the zone itself. The further reduced speed limit shall only be effective for the duration of that special activity and should comply with these guidelines.

Fine Signs

In an attempt to improve work zone safety, the legislature passed a bill in 2001 that provides for increased fines for speeding or speeding in properly posted temporary traffic control zones. The required posting is accomplished through the installation of fine signs.

Fine signs provide the motorist with information on the amount of fine and for what action the fine will be assessed. As with other regulatory signs, these signs are most effective if they are properly applied and enforced. Furthermore, since fines are only applicable when workers are present, these signs shall be removed, covered, or turned from traffic when the condition no longer exists.

The implementation of the speeding portion of this provision may be considered when all four of the following criteria are met or where, upon the judgment of the supervisor, there is a need to control speed through the temporary traffic control zone.

- Work duration longer than 4 hours.

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Should the highway have an improved shoulder, the taper should be extended to the edge of the roadway at the same spacing. In addition to the channelizers, a flagger, STOP or YIELD sign, pilot car, or temporary traffic control signal controls traffic through this section.

The **activity area** is where work activity takes place. It is comprised of three spaces - work, traffic, and buffer.

The **work space** is the area closed to traffic and set aside for workers, equipment, materials, and a protective vehicle, if one is used upstream. They are usually delineated by channelizers or temporary barriers to exclude vehicles and pedestrians.

The **traffic space** is the area in which traffic is routed through the activity area.

The **buffer space** is the area separating traffic from the work space or an unsafe area. Since this area provides some recovery space for an errant vehicle, it should be kept free of any work activity, equipment, vehicles, and material storage. There are two types of buffer spaces - longitudinal and lateral.

A **longitudinal buffer space** may be used in advance of the work space or to separate opposing traffic flows using portions of the same traffic lane. When an item such as a protective vehicle is located in this space, only the area upstream of the item functions as the buffer space.

A **lateral buffer space** may be used adjacent to the work space, an unsafe condition, or between two lanes, especially those carrying traffic in opposite directions. The minimum width of this space is not set but should be determined based on the type of facility, work activity, condition for which the space is being provided, and space available.

Recommended longitudinal buffer length and channelizer spacing in the activity area are shown in the following table.

Speed Limit (mph)	Buffer Length (ft.)	Channelizer Spacing ¹ (ft.)
0-35	120	50 ²
40-45	220	100 ²
50-55	335	100 ²
60-70	550	100 ²

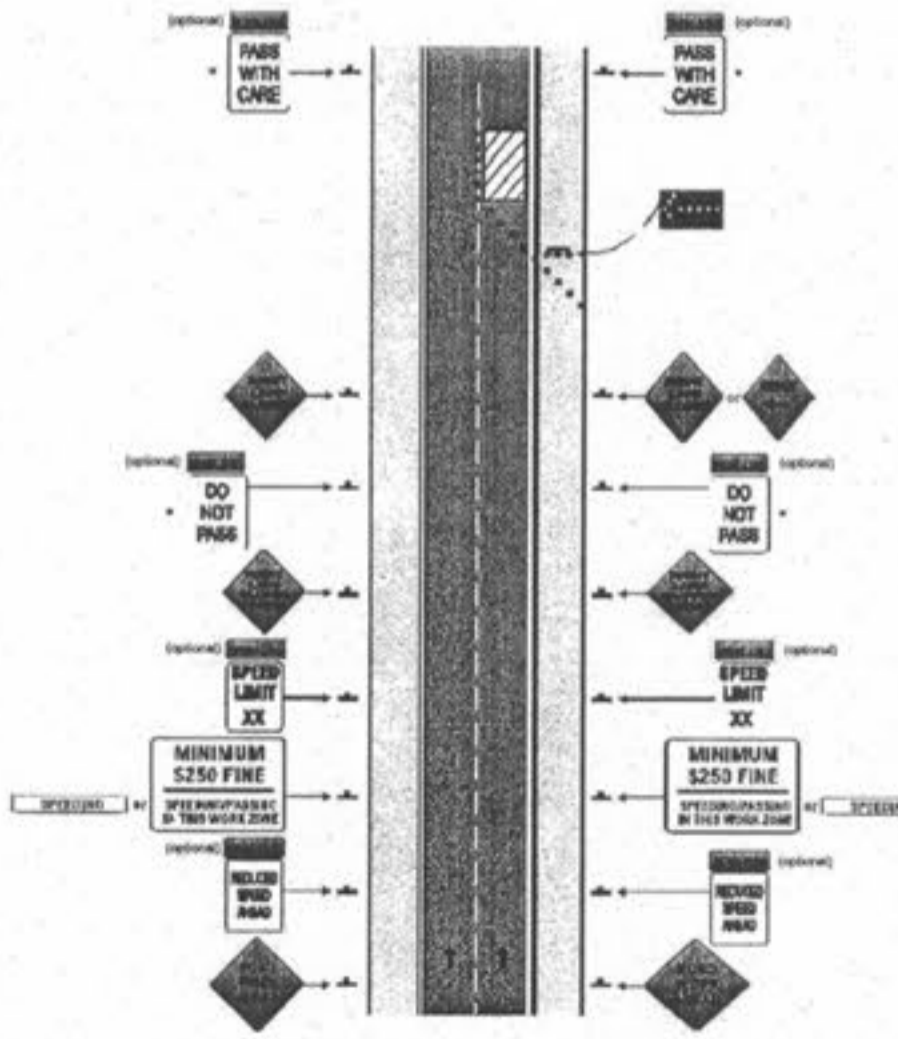
- ¹ Channelizer spacing may be reduced to discourage traffic encroachment.
- ² Spacing reduced to 1/2 at intersections.
- ³ Spacing may be reduced to 1/2 at intersections.

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- Reduced speed limit in effect.
- Normal posted speed greater than or equal to 60 mph.
- Workers on roadway without barrier protection.

The implementation of the passing portion of this provision may be considered when, in addition to meeting the previous criteria or judgment, there is a lane drop on a multi-lane highway consisting of a maximum of two lanes in the affected direction.

When fine signs are used, their location, as well as other signing requirements, shall conform to the following illustration.



• Signs not used when only speeding portion of provision is invoked.

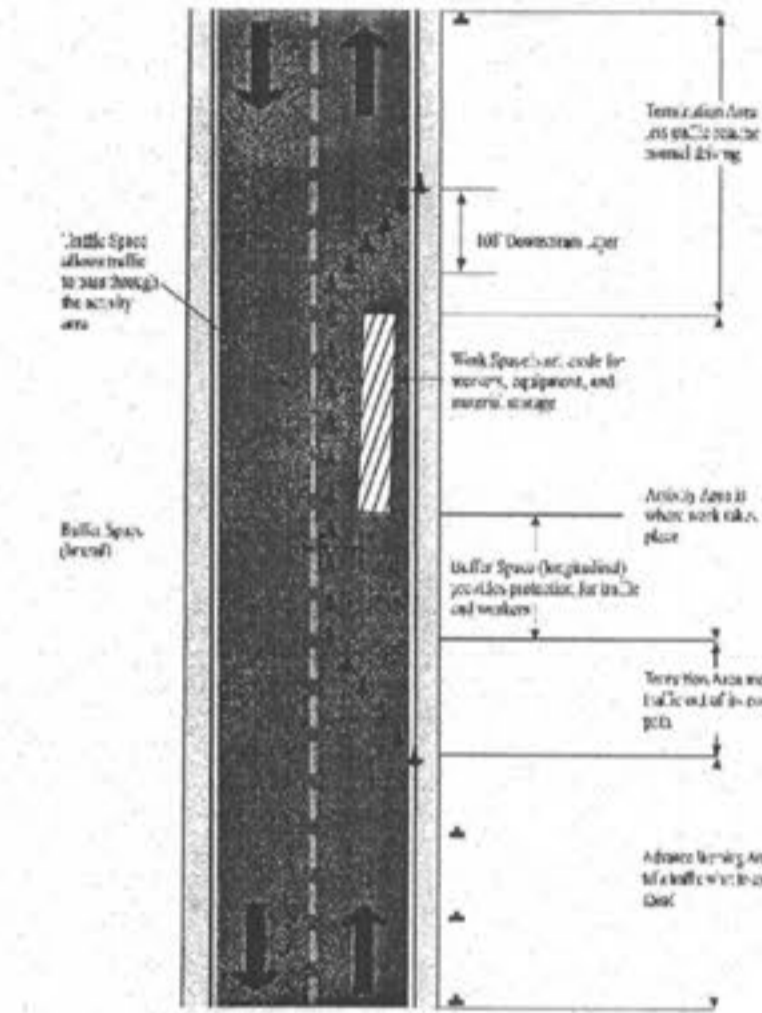
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Temporary Traffic Control Zone

A temporary traffic control zone is a section of highway where traffic conditions are changed due to a work zone or an incident area through the use of temporary traffic control devices, law enforcement, or other authorized officials. It extends from the first warning sign or rotating/strobe lights on a vehicle to the last temporary traffic control device. The zone may either be stationary or move as work progresses.

A temporary traffic control zone consists of four areas - advance warning, transition, activity, and termination.

These areas are illustrated in the following figure.

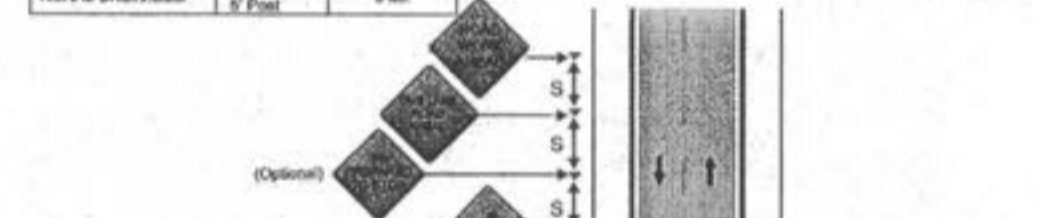


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Lane Closure on Two-Lane Highways Using Flaggers

SPEED	SIGN SPACING (ft.)		TAPER LENGTH (ft.)	OPTIONAL BUFFER LENGTH (ft.)	CHANNELIZER SPACING (ft.)	
	Undivided (ft.)	Divided (ft.)			Shoulder (ft.)	Lane (ft.)
0-35	200	-	-	100	-	50
40-45	350	-	-	200	-	100
50-55	500	-	-	335	-	100
60-70	1000	-	-	550	-	100

TYPE ROADWAY	SIGN HEIGHT	MAXIMUM WORK ZONE LENGTH (ft.)
URBAN	7' Post	1 Mi.
RURAL UNDIVIDED	7' Post	3 Mi.



Notes:

- A protective vehicle shall be used while work is in progress. The protective vehicle should be equipped with a TMA and flashing arrow panel and positioned at least 150 ft. in advance of the work space.
- If a flashing arrow panel is used, the caution mode shall be displayed.
- When a temporary road closure is needed, both directions may be stopped at the same time up to a maximum of 20 minutes.
- Where operational conditions warrant, channelizing devices may be eliminated.
- For short duration operations, signs and channelizers may be reduced or eliminated. The protective vehicle may be eliminated if adequate sight distance exists and the work vehicle uses activated rotating lights or strobe lights.
- For mobile operations where workers are on foot and move with the operation, channelizers may be reduced or eliminated.
- Additional warning signs shall be erected at each intersection with another state highway within the work zone. Upon the discretion of the supervisor, additional warning signs may be erected at other intersections within the work zone.
- For mobile operations, spacing between flagger and FLAGGER AHEAD signs shall not exceed one mile.

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REVISIONS

DATE	BY	DESCRIPTION
9/7/06	AK	CITY OF OFALLON COMMENTS
9/18/06	AK	CITY OF OFALLON COMMENTS
11/16/06	AK	CITY OF OFALLON COMMENTS

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Sheet Number: C4.2