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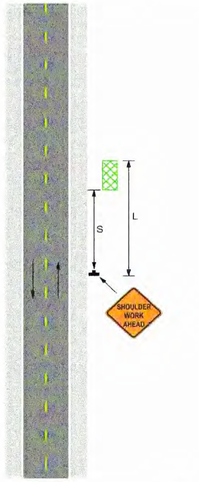
616.8.1 (TA-1) Work Beyond the Shoulder on Divided and Undivided Highways- MT

SPEED	SIGN SPACING (ft.)		TAPER LENGTH (ft.)		OPTIONAL	CHANNELIZER SPACING (ft.)	
Normal Posted (mph)	Undivided (S)	Divided (S)	Shoulder[1] (T1)	Lane[2] (T2)	BUFFER LENGTH (ft.) (B)	Tapers	Buffer/ Work Areas
0-35	200	200	-	-	-	-	-
40-45	350	500	-	-	-	-	-
50-55	500	1000	-	-	-	-	-
60-70	1000	1000	-	-	-	-	-

1. Shoulder taper length based on 10 ft. (standard shoulder width) offset. 2. Lane taper based on 12 ft. (standard lane width) offset

TYPE OF ROADWAY	SIGN HEIGHT	MAXIMUM WORK ZONE LENGTH (L)
URBAN	1' Portable 7' Post	1 Mi.
RURAL DIVIDED	1' Portable 7' Post	2 Mi.
RURAL UNDIVIDED	1' Portable 5' Post	3 Mi.

Sign
Work Space



If work vehicles or equipment are located on the shoulder, refer to appropriate shoulder work typical applications.

On multi-lane, divided highways, signs advising of shoulder work or the condition of the shoulder should be placed only on the side of the affected shoulder.

If work is being performed in the median, signs may be required for both directions of travel based on the following paragraph.

The SHOULDER WORK AHEAD sign may be omitted where the work space is 15 ft. or more from the edge of any shoulder, beyond the ditch line, or behind the curb. Should the roadway not have a shoulder, then 15 ft. or more from the edge of the roadway.

For short duration or mobile operations, signs may be reduced or eliminated if a work vehicle with activated rotating lights or strobe lights is used.

Vehicle hazard warning signals shall not be used instead of the vehicle's rotating lights or strobe lights. Other appropriate signs may be used in lieu of the SHOULDER WORK AHEAD sign.

Where sidewalks are impacted, refer to EPG 616.8.28 (TA-28) Sidewalk Detour or Diversion or EPG 616.8.29 (TA-29) Crosswalk Closures and Pedestrian Detours.

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616.8-3 (TA-3) Shoulder Work on Two-Lane Highways with Edgelines - MT

SPEED	SIGN SPACING (ft.)		TAPER LENGTH (ft.)		OPTIONAL	CHANNELIZER SPACING (ft.)	
Permanent Posted (mph)	Undivided (S)	Divided (S)	Shoulder (1) (T1)	Lane (2) (T2)	BUFFER LENGTH (ft.) (B)	Tapers	Buffer/ Work Areas
0-35	200	-	70	245	280	35	40
40-45	350	-	150	540	400	40	80
50-55	500	-	185	660	560	50	80
60-70	1000	-	235	840	840	60	120

1 Shoulder taper length based on 10 ft. (standard shoulder width) offset. 2. Lane taper length based on 12 ft. (standardlane width) offset.

TYPE OF ROADWAY	SIGN HEIGHT	MAXIMUM WORK ZONE LENGTH (L)
URBAN	1' Portable 7' Post	1 Mi.
RURAL UNDIVIDED	1' Portable 5' Post	3 Mi.

Channelizer
Sign
Truck or Trailer Mounted Arrow Panel
Protective Vehicle
Truck Mounted Attenuator (TMA)
Work Space

In addition to shoulder work, this typical application is applicable to work beyond shoulder where vehicles and equipment are parked on the shoulder.

A protective vehicle shall be used while work is in progress. The protective vehicle should be equipped with a TMA and positioned at least 150 ft. in advance of the work space.

If encroachment onto driving surface occurs and there is not 10 ft. of driving surface available for the lane of traffic, that traffic lane shall be closed. Refer to appropriate lane closure typical applications.

If an arrow panel is used for an operation on the shoulder, the caution mode shall be displayed.

For short duration or mobile operations, signs, channelization devices, and protective vehicles may be reduced or eliminated if a work vehicle with activated rotating lights or strobe lights is used. However, if limited sight distance exists, a protective vehicle should be used. This protective vehicle should be equipped with a TMA and truck mounted flashing arrow panel and positioned at least 150 ft. in advance of the work space or work vehicle, as applicable. If a protective vehicle is used, a vehicle mounted sign shall be mounted at a recommended height of 48 in. above the road surface.

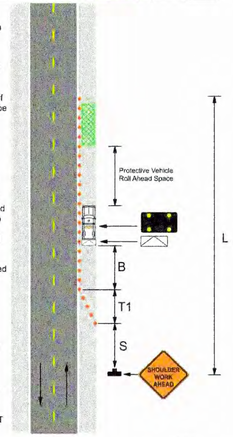
For work beyond shoulder, where vehicles and equipment are parked on the shoulder, the protective vehicle may be eliminated if a work vehicle with activated rotating lights or strobe lights is used.

Vehicle hazard warning signals shall not be used instead of the vehicle's rotating lights or strobe lights.

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.

Other appropriate signs may be used in lieu of SHOULDER WORK AHEAD sign.

SEE EPG 616.12 WORK ZONE SPEED LIMITS FOR SPEED LIMIT GUIDELINES.



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616.8.5 (TA-5) Shoulder Work on Divided Highways - MT

SPEED	SIGN SPACING (ft.)		TAPER LENGTH (ft.)		OPTIONAL	CHANNELIZER SPACING (ft.)	
Permanent Posted (mph)	Undivided (S)	Divided (S)	Shoulder (1) (T1)	Lane (2) (T2)	BUFFER LENGTH (ft.) (B)	Tapers	Buffer/ Work Areas
0-35	-	200	70	245	280	35	40
40-45	-	500	150	540	400	40	80
50-55	-	1000	185	660	560	50	80
60-70	-	SA - 1000 SB - 1500 SC - 2640	235	840	840	60	120

1 Shoulder taper length based on 10 ft. (standard shoulder width) offset. 2. Lane taper length based on 12 ft. (standard lane width) offset.

TYPE OF ROADWAY	SIGN HEIGHT	MAXIMUM WORK ZONE LENGTH (L)
URBAN	1' Portable 7' Post	1 Mi.
RURAL DIVIDED	1' Portable 7' Post	2 Mi.

Channelizer
Sign
Truck or Trailer Mounted Arrow Panel
Protective Vehicle
Truck Mounted Attenuator (TMA)
Work Space

In addition to shoulder work, this typical application is applicable to work beyond shoulder where vehicles and equipment are parked on the shoulder.

A protective vehicle shall be used while work is in progress. The protective vehicle should be equipped with TMA and positioned at least 150 ft. in advance of the work space.

If encroachment onto driving surface occurs and there is not 10 ft. of driving surface available for the lane of traffic, that traffic lane shall be closed. Refer to appropriate lane closure typical applications.

If an arrow panel is used for an operation on the shoulder, the caution mode shall be displayed.

For short duration or mobile operations, signs, channelization devices, and protective vehicles may be reduced or eliminated if a work vehicle with activated rotating lights or strobe lights is used. However, if limited sight distance exists, a protective vehicle should be used. This protective vehicle should be equipped with a TMA and truck mounted flashing arrow panel and positioned at least 150 ft. in advance of the work space or work vehicle, as applicable. If a protective vehicle is used, a vehicle mounted sign shall be mounted at a recommended height of 48 in. above the road surface.

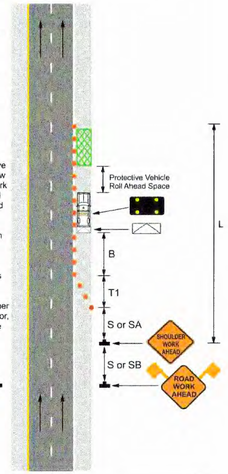
For work beyond shoulder, where vehicles and equipment are parked on the shoulder, the protective vehicle may be eliminated if a work vehicle with activated rotating lights or strobe lights is used.

Vehicle hazard warning signals shall not be used instead of the vehicle's rotating lights or strobe lights.

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.

Other appropriate signs may be used in lieu of SHOULDER WORK AHEAD sign.

SEE EPG 616.12 WORK ZONE SPEED LIMITS FOR SPEED LIMIT GUIDELINES.



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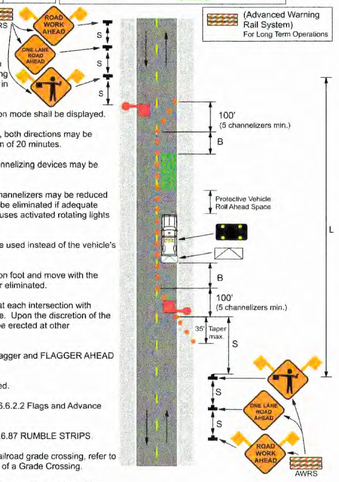
616.8.10 (TA-10) Lane Closure on Two-Lane Highways With Edgelines Using Flaggers - MT

SPEED	SIGN SPACING (ft.)		TAPER LENGTH (ft.)		OPTIONAL		CHANNELIZER SPACING (ft.)
Permanent Posted (mph)	Undivided (S)	Divided (S)	Shoulder (1) (T1)	Lane (2) (T2)	BUFFER LENGTH (ft.) (B)	Tapers	Buffer/ Work Areas
0-35	200	-	-	-	280	-	40
40-45	350	-	-	-	400	-	80
50-55	500	-	-	-	560	-	80
60-70	1000	-	-	-	840	-	120

1 Shoulder taper length based on 10 ft. (standard shoulder width) offset. 2. Lane taper length based on 12 ft. (standardlane width) offset.

TYPE OF ROADWAY	SIGN HEIGHT	MAXIMUM WORK ZONE LENGTH (L)
URBAN	1' Portable 7' Post	1 Mi.
RURAL UNDIVIDED	1' Portable 5' Post	3 Mi.

Channelizer
Sign
Truck or Trailer Mounted Arrow Panel
Flagger
Protective Vehicle
Truck Mounted Attenuator (TMA)
Work Space
(Advanced Warning Rail System) For Long Term Operations



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.

Vehicle hazard warning signals shall not be used instead of the vehicle's 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.

At night, flagger stations shall be illuminated.

For long-term operations, refer to EPG 616.6.2.2 Flags and Advance Warning Rail System.

If rumble strips are used, review EPG 616.6.87 RUMBLE STRIPS.

For work zone located in the vicinity of a railroad grade crossing, refer to EPG 616.8.46 (TA-46) Work in the Vicinity of a Grade Crossing.

SEE EPG 616.12 WORK ZONE SPEED LIMITS FOR SPEED LIMIT GUIDELINES.

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616.8.17a (TA-17a) Mobile Operation on Two-Lane Highways without Edgelines - MT

NOTES:

A protective vehicle shall be used when work is in progress and shall be equipped with a vehicle mounted sign. The protective vehicles may be equipped with a TMA and flashing arrow panel.

For vehicle mounted signs, a mounting height of 48 in. from the bottom of the sign to the road surface is recommended.

If the flashing arrow panel is used, the caution mode shall be displayed.

The Light Bar and Emergency Alert lights are optional on the protective vehicle. If used, the rear facing amber/white light bar is installed on top of the vehicle and the Emergency Alert lights are installed below the flashing arrow panel.

Where practical and when needed, the work and protective vehicles should pull over periodically to allow traffic to pass.

Whenever adequate stopping distance exists to the rear, the protective vehicle should be positioned at least 150 ft. upstream of the work vehicle and proceed at the same speed. The protective vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.

For mobile operations on roadways posted at 45 mph or below, the protective vehicle is optional provided the work vehicle uses activated rotating lights or strobe lights.

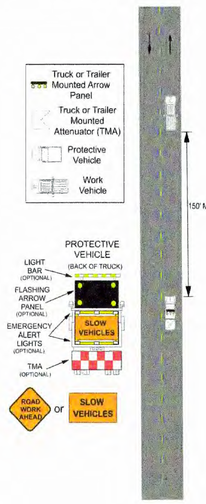
For mobile operations moving at a continuous speed within 15 mph of the posted speed and emergency snow removal operations, the protective vehicle is optional provided the work vehicle uses activated rotating lights or strobe lights.

Vehicle hazard warning signals shall not be used instead of the vehicle's rotating lights or strobe lights.

For mobile operations where workers are on foot and move with the operation, the affected lane shall be closed. Refer to appropriate lane closure typical applications.

For pavement marking operations refer to EPG 616.8.17b (TA-17b) Centerline/Edgeline Striping on Two-lane Highways.

For additional guidance on Truck/Trailer Mounted Attenuators (TMA) see EPG 612 Impact Attenuators.



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616.8.22 (TA-22) Lane Closure of Right Lane on Far Side of Intersection - MT

SPEED	SIGN SPACING (ft.)		TAPER LENGTH (ft.)		OPTIONAL	CHANNELIZER SPACING (ft.)	
Permanent Posted (mph)	Undivided (S)	Divided (S)	Shoulder (1) (T1)	Lane (2) (T2)	BUFFER LENGTH (ft.) (B)	Tapers	Buffer/ Work Areas
0-35	200	200	70	245	280	35	40
40-45	350	500	150	540	400	40	80
50-55	500	1000	185	660	560	50	80
60-70	1000	SA - 1000 SB - 1500 SC - 2640	235	840	840	60	120

1 Shoulder taper length based on 10 ft. (standard shoulder width) offset. 2. Lane taper length based on 12 ft. (standard lane width) offset.

TYPE OF ROADWAY	SIGN HEIGHT	MAXIMUM WORK ZONE LENGTH (L)
URBAN	1' Portable 7' Post	1 Mi.
RURAL DIVIDED	1' Portable 7' Post	2 Mi.
RURAL UNDIVIDED	1' Portable 5' Post	3 Mi.

Channelizer
Sign
Work Space
Truck or Trailer Mounted Arrow Panel
(Advanced Warning Rail System) For Long Term Operations

This typical application is applicable to intersections with right of way control on all approaches.

A protective vehicle shall be used while work is in progress when space allows. The protective vehicle should be equipped with a TMA and positioned at least 150 ft. in advance of the work space. The protective vehicle may be eliminated if the roadway is posted at 45 mph or below, the work vehicle is positioned in advance of the work space, and the work vehicle uses activated rotating lights or strobe lights.

At locations where right turn movements are minimal or where the inclusion of the turning traffic with the traffic using the adjacent open lane will not affect capacity of the approach, it is acceptable to close any lane not carried through the intersection prior to the intersection. Thereby, eliminating the turn bay shown. If right-turn movements are significant, however, the right lane may be left open prior to the intersection but restricted to right-turn movements only. In this case, all channelization devices prior to the intersection are eliminated except those that might be used to form a temporary island emphasizing the mandatory turning movement.

For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through motor vehicle traffic.

If the work space extends across the crosswalk, the crosswalk should be closed using the information and devices shown in EPG 616.8.29 (TA-29) Crosswalk Closures and Pedestrian Detours.

Buffer and taper lengths noted in table may be modified to fit conditions.

For short duration operations, signs and channelizers may be reduced or eliminated.

For mobile operations where workers are on foot and move with the operation, channelizers may be reduced or eliminated.

Where possible, signs should be provided on both sides of the affected approach when the approach is two or more lanes wide.

For high speed facilities, channelizer spacing may be reduced to ½ spacing noted in table.

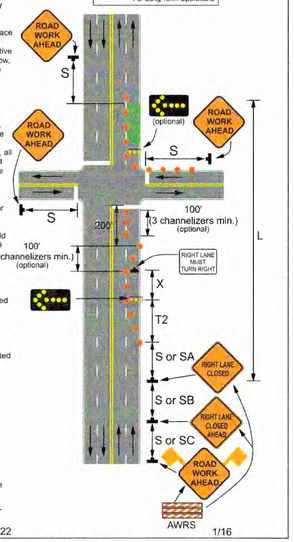
Other appropriate signs may be used in lieu of the ROAD WORK AHEAD sign.

Supplemental warning methods may be used to call attention to the work zone.

If rumble strips are used, review EPG 616.6.87 RUMBLE STRIPS.

For long-term operations, refer to EPG 616.6.2.2 Flags and Advance Warning Rail System.

SEE EPG 616.12 WORK ZONE SPEED LIMITS FOR SPEED LIMIT GUIDELINES.



PROJECT TITLE:
ALTAIR AT THE PRESERVE
(FKA WINGHAVEN POINTE)

Bax Project # 14-16403 Issue Date: 03/09/2016

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STATE OF MISSOURI
CLIFFORD L. HEITMANN
NUMBER E-29817
REGISTERED PROFESSIONAL ENGINEER
2-5-18

CLIFFORD L. HEITMANN
CIVIL ENGINEER
E29817

REVISIONS

04/25/2016	DCSD & PWSD2 COMMENTS
05/16/2016	CITY REVIEW
06/15/2016	CITY REVIEW & DCSD COMMENTS
07/29/2016	CITY REVIEW
08/04/2016	MODOT REVIEW
06/29/2017	MODOT REVIEW

Developer / Owner:
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ST. LOUIS, MISSOURI 63131
314-821-9600

MoDOT TYPICAL APPLICATIONS

P+Z No.
#9831.65.02

City No.
#

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