

Temporary Traffic Control Layout Selection by Maintenance Activity

(Supplemental Guidebooks)

Minnesota Department of Transportation

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Office of Transportation System Management

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Temporary Traffic Control – Layout Selection by Maintenance Activity

FINAL Report

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This report represents the results of research conducted by the authors and does not necessarily represent the views or policies of the Minnesota Department of Transportation and/or the Center for Transportation Studies. This report does not contain a standard or specified technique.

The authors and the Minnesota Department of Transportation and/or Center for Transportation Studies do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to this report.

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Technical Advisory Panel

The following members comprise the project's Technical Advisory Panel (TAP) that contributed to this project:

Jim Grothaus (chair), U of M LTAP Janelle Anderson, MnDOT Tort Claims Nick Anderson, Big Stone County Lon Aune, Marshall County Marc Briese, Stonebrooke Janelle Borgen, WSB Bruce Holdhusen, MnDOT RSS Jon Jackels, SRF Consulting Group Ken Johnson, MnDOT Paul Kauppi, City of Woodbury Tom Knakmuhs, Norman County Renae Kuehl, SRF Consulting Group Victor Lund, St. Louis County Michael Marti, SRF Consulting Group Russ Matthys, City of Eagan Sue Miller, Freeborn County Dan Sauve, Clearwater County Kathleen Schaefer, CTAP Ted Ulven, MnDOT Mark Vizecky, MnDOT State Aid

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Introduction:

The intent of this document is to help local agencies identify the appropriate work zone layout based on the maintenance activity that will be performed. This document focuses on low volume roads only and includes both a rural and urban guide that are intended to be used as supplemental guidance to the Temporary Traffic Control Work Zone Layouts Field Manual (dated January 2014). The information presented here does not replace or override anything within the field manual. Agencies must follow the standards and guidance contained in the Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD), including the Field Manual. This document also includes a copy of a letter that was written and submitted to the MUTCD Committee in April 2016, requesting changes for low volume roadways. A summary of training opportunities and resources is included as well.

Rural Temporary Traffic Control – Layout Selection by Maintenance Activity

Printing Instructions:

The supplemental guides are formatted to be printed as a booklet. The printed document is the same size as the field manual so that it can be stored within the book. In order for it to print properly, use these printing settings:

- o Landscape
- 2-sided, flip on the short side (if you flip on long side ½ of the pages will be upside down)
- Color (preferred, but optional)

Once printed, fold the entire stack of paper in half to create a booklet. Staple the seam, if available.

Temporary Traffic Control Layout Selection by Maintenance Activity

LOW VOLUME RURAL STREET OR HIGHWAY - JANUARY 2016

The intent of this document is to **help local agencies identify the appropriate work zone layout based on the maintenance activity that will be performed.** This document is intended to be used as supplemental guidance to the *Temporary Traffic Control Zone Layouts Field Manual* (dated January 2014). The information presented here does not replace or override anything within the field manual. Agencies must follow the standards and guidance contained in the Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD), including the Field Manual.



Temporary Traffic Control Zone Layouts Field Manual (dated January 2014).

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LRRB Report Number 2016RIC09A

RURAL

Criteria to use this document:

- Rural Highway
- Low Volume (<400 ADT)
- Mobile, Short Duration or Short Term work only
- Attended work zones

How to use this document:

- 1. Identify your maintenance activity and work duration
- 2. Use the matrix on page 3 to select a layout to consider
- 3. Find the box that corresponds with the suggested layout on the following pages.
- 4. Read the "Notes from field manual" section and the questions under the section "Is this the appropriate layout?"
- 5. If the layout is not appropriate, use the guidance provided to identify a better layout.
- 6. Once the appropriate layout is identified, use the Field Manual for guidance on how to setup the work zone in the field, and the "Minimum Required Devices" section as guidance on the minimum devices needed when using the layout.

NOTES

LAYOUT 80

n	UAD CLUSUNE				
s	SHORT OR INTERMEDIATE TERM	DAYLIGHT	OR NIGHTTIME HOURS		
		,	ALL ROADWAYS		
Ma ∙ ⊦	Maintenance Activities: • Road closure				
Ge Lay	eneral Information: yout 80 is for a total closure that lasts le	ss than 3 days			
No 1.	Notes from Field Manual: 1. The Road Authority will determine if a detour is required and specify the detour route				
2.	2. Road Closure Notice sign should be installed seven days in advance of the closure.				
3.	 Install at the last driveway or intersection beyond which there is no public access. 				
Is t Wil Car If t	Is this the appropriate layout? Will the closure be less than 3 days? Can you meet all requirements of Layout 80? If the answer is NO, a special temporary traffic control plan must be considered				
	Minimum Required	Devices for	55 MPH:		
	Description	Qty	Device		
R R L	OAD CLOSED TO THRU TRAFFIC or OAD CLOSED XX MILES AHEAD OCAL TRAFFIC ONLY signs	1	ROAD CLOSED TO THRU TRAFFIC OF ROAD CLOSED X MILES AHEAD LOCAL TRAFFIC ONLY		
R	ROAD CLOSED AHEAD XX FEET sign	1	ROAD CLOSED AHEAD 500 FEET		

1

3*

*with enough to completely close the road at point of closure.

ROAL

CLOSED

HEA

Layout Selection Matrix by Maintenance Activity:

		WORK DURATION		
	RURAL	MOBILE	SHORT DURATION	SHORT TERM
	MAINTENANCE ACTIVITY	15 Minutes or less	One Hour or less	12 Hours or less
	Asphalt pavement patching	5	8	9
	Concrete pavement patching	-	-	9
	Temporary pothole patching	5	8	-
	Crack Filling	-	8	13
	Crack sealing - route and seal	-	-	13
road	Surface treatment	-	-	13
ō	Grading a gravel road	72	-	-
	Road closure	81	80	80
	Culvert maintenance (partial road closure)	-	-	9, 10
	Shouldering	5, 71	-	-
	Shoulder disking/blading	5, 71	-	-
	Mowing	71	-	-
	Tree/Brush removal	5, 71	8	9, 10
	Debris removal - routine (e.g. litter pickup)	5	2	-
ide	Debris removal - Large item (e.g. couch, roadkill)	5	-	-
oads	Utility repair	2	2	2
f	Sign repair	5	2	-
	Snow cleanup	5	-	-
	Driveway culvert maintenance	2	2	2
	Ditch maintenance (partial road closure)	-	-	2

ROAD CLOSED AHEAD sign

Type III Barricade

Duration of Work Definitions

Since low volume roads with less than 400 ADT are two-lane two-way highways, the first and most important decision for temporary traffic control is to ensure you select a layout with the proper duration of work. The Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD) defines Duration as follows:

Duration - the length of time any work operation occupies a specific location or causes a traffic obstruction without changing the location. This time is measured from the first disruption to traffic until the total clearing of the area. The following durations are defined in overlapping intervals since Temporary Traffic Control (TTC) layouts for longer durations may always be used for shorter durations, especially when roadway attributes such as traffic volume and speed, and the work space location may warrant higher levels of traffic control.

- Mobile when an operation is continuously moving or stopped in one location for periods of 15 minutes or less. The traffic control devices are typically vehicle-mounted. The work area should change by at least the decision sight distance for it to be considered a change in location.
- Short Duration when an operation stays in one location during daylight conditions from 15 minutes to one hour, such that minimal TTC devices are deployed.
- Short Term when an operation stays in one location during daylight conditions • from 15 minutes to twelve hours, such that advance signing and channelizing devices are required.
- Intermediate Term/Night when an operation stays in one location during daylight conditions from 15 minutes to no more than 3 days, or stays in one location during hours of darkness. Advance signing and larger channelizing devices (Type B) are required.
- Long Term when an operation stays in one location for more than 3 days. A project specific Traffic Control Plan is typically required.

Required Devices

Although cones are the typical channelizer for short term operations, they cannot be used in unattended work zones (Section 6F-64 of MN MUTCD). If leaving a lane closure or marking work when the workers are not present a higher level channelizer, such as a drum or barricade must be used.

LAYOUT 13 LANE CLOSURE, TWO FLAGGER – TWO-LANE TWO-WAY ROAD		
SHORT OR INTERMEDIATE TERM DAYLIGHT OR NIGHTTIME HOUP		
	ALL TWO-LANE TWO-WAY ROADWAYS	

Crack sealing - route and seal

General Information:

Layout 13 is not restricted to short term (daylight hours and 12 hours or less) but can be used for 3 days or less (Intermediate term). This layout contains some guidance on the application of Decision Sight Distance for flagger location and requires the use of two flaggers.

Notes from Field Manual:

- The approach sight distance to the flagger shall be at least the Decision Sight Distance (D).
- 2. The ONE LANE ROAD AHEAD sign may be omitted when the posted speed limit is 40 mph or less.
- The two-way taper should be 50 feet and using five equally spaced channelizing З. devices.

Is this the appropriate	e Minimum Required Devices for 55 MPI		
layout? Can you meet all requirements	Description	Qty	Device
of Layout 13? If the answer to any of these is no, a special temporary traffic control plan must be	ROAD WORK AHEAD sign	2	ROAD WORK AHEAD
considered.	ONE LANE ROAD AHEAD sign	2	ONE LANE ROAD AHEAD
	FLAGGER AHEAD sign	2	
	Flagger and STOP SLOW paddle	2	
	28" cones or other channelizing device	15*	
	*with an additional channe of work s	elizer for ev space.	very 100 fee

SHORT OR INTERMEDIATE TERM	DAYLIGHT OR NIGHT	TIME	HOURS
500 FEET MAXIMUM WORK SPACE	USE FOR ROADS LE ADT ONL	SSTH/ .Y	AN 400
Maintenance Activities: Culvert maintenance (partial road closure Tree/brush removal 	*)		
General Information: Layout 10 has a maximum work space is 50 roadways with <400 ADT. Layout 10 is not and 12 hours or less) but can be used for 3 layout contains some guidance on the appl flagger location and whether a second flag	00 feet and it is restricted t restricted to short term (d days or less (Intermediate ication of Decision Sight D ger is required.	o use o aylight term). istance	on hours This for
 The approach sight distance to the flag Distance. If the flagger's ability to see oncoming than the Decision Sight Distance (D), t STOP signs shall be installed if the wo see Layout 20. The two-way taper should be 50 feet i channelizing devices 	gger shall be at least the D motorists beyond the wor wo flaggers shall be used rk space must be left unat n length using 5 equally sp	ecision k space - See L tended aced	Sight e is less ayout 13. at night -
Is this the appropriate layout? Is the work space less than 500 feet long? Will traffic be able to be controlled by a single flagger? Can you meet all requirements of Layout 10?	Minimum Required I MPH: Description ROAD WORK AHEAD signs	Oevice Oty 2	Device
If the answer to any of these is no, layout 13 must be considered.	FLAGGER AHEAD signs	1	
	Flagger and STOP SLOW paddle	1	Ť
	28" cones or other channelizing device	15*	

100 feet of work space.

16

If an existing pedestrian route is impacted by a short-term or short-duration work zone that is attended with project personnel, establishing an alternate pedestrian route may not be necessary if the work can be stopped and pedestrians can navigate the work zone safely. Pedestrians may be delayed for a short period of time for project personnel to move equipment and material to facilitate passage. Work zone personnel may also provide assistance to the pedestrian as necessary.

If alternative pedestrian layouts are needed, Layouts 84 a&b and 85 a&b of the Field Manual should be considered.

Mobile Layouts

Since most of the speed limits on rural low volume roadways are 55 mph and the corresponding decision sight distance is 1200 feet, to meet this definition the work space has to move at least 4800 feet per hour, or approximately one mile per hour.

Will your work move more than 1200 feet every 15 minutes, or approximately one mile per hour?

If not, do not use a mobile layout and consider a stationary (short duration or short term) layout.

LAYOUT 9 LANE CLOSURE, NO FLAGGER - TWO-LANE TWO-WAY ROAD SHORT TERM **DAYLIGHT HOURS USE FOR ROADS LESS THAN 400 500 FEET MAXIMUM WORK SPACE** ADT ONLY Maintenance Activities: • Culvert maintenance (partial road closure) • Asphalt pavement patching Tree/brush removal • Concrete pavement patching General Information: Layout 9 has a maximum work space length of 500 feet and is for short term (daylight hours and 12 hours or less) application. There is not specific guidance on determining when traffic is unable to self-regulate included in this layout. **Notes from Field Manual:** 1. When traffic cannot regulate itself through the length of the work space, use Layout 10. 2. STOP signs shall be installed if the work space must be left unattended at night see Lavout 20. 3. The two-way taper should be 50 feet in length using 5 equally spaced channelizing devices. Is this the appropriate layout? **Minimum Required Devices for 55** Is the work space less than 500 feet MPH: long? Description Qty Device Will traffic be able to self-regulate without the use of a flagger? **ROAD WORK** Is the work during daylight hours? 2 AHEAD signs Can you meet all requirements of Layout 9? If the answer to any of these is no. 28" cones or other Layout 10 must be considered. 15* channelizing device *Minimum number of cones for a 500 foot work space is 19.

LAYOUT 2 SHOULDER CLOSURE WORK ON OR NEAR SHOULDER			
SHORT OR INTERMEDIATE TERM DAYLIGHT HOURS			
OFF TRAVELED ROADWAY	ALL ROADWAYS		
Maintenance Activities: • Sign repair • Debris removal - routine (e.g. litter pickup) • Sign repair • Utility repair • Driveway culvert maintenance • Ditch maintenance • Ditch maintenance			
General Information: Layout 2 is for work on the shoulder or off of the traveled roadway for all types, speeds and volumes of streets and highways. Even so, the requirements and options presented in this layout make it appropriate for many shoulder and off roadway operations on low volume roadways.			

Notes from Field Manual:

- 1. All signs, barricades and channelizing devices may be omitted when the work occupies an isolated shoulder location for less than one hour and it has little or no interference with traffic
- 2. An operation which moves between work spaces that are less than the decision sight distance along the shoulder should use a stationary or mobile shoulder closure.
- З. The ROAD WORK AHEAD sign may be omitted for short term daylight operations if:
 - a. the distance from curb face to the work space is at least 2 feet, or
 - b. the distance from the edge of the roadway to the work space is at least 15 feet and a vehicle displaying a 360-degree flashing beacon is operating.
- This ROAD WORK AHEAD sign shall be installed on 2-lane, 2-way roads if traffic 4. control devices are installed for a work space in the opposite shoulder.

Is this the appropriate layout?

Will the work zone be entirely off the traveled lanes?

Can you meet all requirements of Layout 2?

If the answer to any of these is NO, the appropriate short term stationary layout must be considered.

Iviinimum Required Devices for 55		
MPH: No Devices are required if less than one hour with little or no interference with traffic. For all other conditions:		
Description	Qty	Device
ROAD WORK AHEAD signs	1 or 2	ROAD WORK AHEAD
28" cones or other	6*	A

*with an additional channelizer for every 100 feet of shoulder closure

WORK IN TRAVELED LANES **Maintenance Activities:**

• Asphalt pavement patching

MOBILE

- Temporary pothole patching
- Shouldering
- Shoulder disking/blading
- Tree/brush removal

LAYOUT 5

• Debris removal - routine (e.g. litter pickup)

DAYLIGHT HOURS

USE FOR ROADS LESS THAN 1500

ADT ONLY

- Debris removal large item (e.g. couch, roadkill)
- Sign repair
- Snow cleanup

General Information:

Layout 5 covers most of the mobile applications for low volume roads where work is conducted on the traveled lanes

Notes from Field Manual:

Minimum Required Devices for 55 MPH:

1. If the approach sight distance is restricted, a spotter should be used to protect the work area and to warn the driver.

LANE CLOSURE - TWO LANE TWO WAY ROAD

- 2. If the visibility is poor or the operation does not move at least the Decision Sight Distance (D)every 15 minutes, the appropriate stationary lavout should be used.
- 3. This layout may be used for nighttime operations only in locations where the posted speed limit is 40 mph or less.
- 4. The slow moving or stopped work vehicle should keep the traffic lane as wide as possible by using the shoulder space whenever possible.

Is this the appropriate layout?

Can you meet all requirements for Layout 5 of the Field Manual?

If the answer is NO, the appropriate stationary layout must be considered

There are no minimum required devices.

The STANDARD that applies is: Mobile operations shall have appropriate

devices on the equipment (that is, highintensity rotating, flashing, oscillating, or strobe lights, signs, or special lighting), or shall use a separate vehicle with appropriate warning devices.

Description	Qty	Device
Flashing Vehicle Light	1	

LAYOUT 71

WORK OFF ROADWAY MOBILE OPERATIONS HAVING LITTLE OR NO INTERFERENCE WITH TRAFFIC

MOBILE	DAYLIGHT HOURS	
LITTLE OR NO INTERFERENCE WITH TRAFFIC	ALL ROADWAYS	
Maintenance Activities:		
Shouldering	Mowing	
 Shoulder disking/blading 	 Tree/brush removal 	

General Information:

Layout 71 is for work that is off the roadway where there is little or no interference with traffic. This layout can be used for all highways regardless of traffic volume.

Notes from Field Manual:

- 1. The operations should be scheduled and completed during daylight work shifts and have little or no interference with traffic. The work should be suspended during periods of poor weather or visibility.
- 2. All vehicles shall be equipped with a flashing vehicle light visible 360-degrees around the vehicle when viewed from a distance of 60 feet.
- 3. The ROAD WORK AHEAD sign may be omitted when there is an adequate approach decision sight distance to the equipment along the majority of the route.
- 4. When advance warning signs are used, the signs should be no more than 3 miles from the work vehicle. The location of the signs should be determined by the sources of traffic, such as major cross roads.
- 5. On roadways where decision sight distance is restricted and the equipment must encroach into the traffic lane routinely, a shadow vehicle may be used as shown.

Is this the appropriate layout?

Is your work area off the roadway with

little or no interference with traffic? All vehicles s

Can you meet all requirements of Layout 71?

If the answer to any of these is NO, the appropriate stationary layout must be considered.

Minimum Required Devices for 55 MPH:

All vehicles shall be equipped with a flashing vehicle light visible 360-degrees around the vehicle when viewed from a distance of 60 feet.

A SLOW MOVING vehicle sign is required for all slow moving vehicles operating on public roadways.

Description	Qty	Device
Flashing Vehicle Light	1	
SLOW MOVING sign	1	

Short Term Layouts

Short Term - when an operation stays in one location during daylight conditions from 15 minutes to twelve hours, such that advance signing and channelizing devices are required.

Will your operation stay in one location for less than 12 hours?

If the answer is NO, consider the use of the appropriate Intermediate Term layout.

Many of the short term layouts in the field manual are also intermediate term layouts which can remain in place for up to three days and during night time conditions. For these situations remember cones cannot be used in unattended work zones.

LAYOUT 8 EQUIPMENT IN TRAFFIC LANE - TV	NO-LANE TWO-WAY F	ROAD	
SHORT DURATION	DAYLIGHT H	OURS	
50 FEET MAXIMUM WORK SPACE	USE FOR ROADS LES ADT ONL	SSTHA .Y	N 1500
Maintenance Activities: Asphalt pavement patching Temporary Pothole Patching 	Crack FillingTree/brush removal		
General Information: Layout 8 has a maximum work area length time restriction, limits the use of this layour specific guidance on determining when tra- this layout.	of 50 feet which, along wi t to very specific work type ffic is unable to self-regula	th the c es. Ther te inclu	one hour re is not ded in
 Notes from Field Manual: The work vehicle shall not be parked of the shall not be shall not be parked of the shall not be parked of the shall	on the shoulder opposite of mbol sign may be omitted v to regulate itself through the n length using 5 equally sp Minimum Required I	the co when tr he leng aced	aned area. raffic ith of the es for 55
hour or less?	Description	Qty	Device
8? If the answer to any of these is NO, the appropriate short term stationary layout must be considered.	ROAD WORK AHEAD signs	2	ROAD WORK AHEAD
	FLAGGER AHEAD signs	1	
	Flagger and STOP SLOW paddle	1	ÎŤ.
	28" cones or other channelizing device	10	

LAYOUT 72 GRAVEL ROAD MAINTENANCE GR LANE TWO-WAY ROAD	ADING OPERATIONS	– TW	0-
MOBILE	DAYLIGHT HO	OURS	
ROAD GRADING OPERATIONS	GRAVEL RO	ADS	
Maintenance Activities:Grading a gravel road			
General Information: Layout 72 is specific to grading gravel roads	5.		
 Notes from Field Manual: Grading operations should be schedule shifts. Work should be suspended duri Motor Graders shall be equipped with around the vehicle when viewed from Motor grader blade end(s) may be man additional warning and make the equip The ROAD WORK AHEAD signs may be approach decision sight distance to the route. When advance warning signs are used miles from the work vehicle. The locat the sources of traffic, such as major criteria. 	ed and completed during da ng poor weather or visibilit a flashing vehicle light visil a distance of 60 feet. wed with red or orange flag oment more visible to passi be omitted when there is an e motor grader along the m d, the signs should be no m ion of the signs should be of oss roads.	aylight y cond ole 360 gs to pr ing veh n adequ najority nore tha determ	work itions. degrees rovide icles. Jate of the an 3 ined by
Is this the appropriate layout? Can you meet all requirements of Layout 72? If the answer to any of these is NO, the appropriate stationary layout must be considered.	Minimum Required I MPH: Motor Graders shall be ed flashing vehicle light visib around the vehicle when distance of 60 feet. A SLOW MOVING vehicle for all slow moving vehicle public roadways.	Device quipped le 360- viewed e sign is es ope	s for 55 d with a degrees l from a s required rating on
	Description	Qty	Device
	Flashing Vehicle Light	1	
	SLOW MOVING sign	1	

LAYOUT 81 TEMPORARY ROAD	CLOS	URE – TW	/O LANE TWO WAY R	OAD	
MOBILI	E		DAYLIGHT OR NIGHT	TIME	HOURS
TOTAL CLOSURE 15 LESS	MINU	TES OR	ALL ROADW	IAYS	
Maintenance ActivitiRoad closure	es:				
General Information: Layout 81 is for a total cl	osure t	hat lasts les	ss than 15 minutes		
 Notes from Field Ma The traffic from both Conditions represent For night closures, t a. Law enforceme b. A changeable mt The BE PREPARED is 40 mph or less. 	nual: n lanes he follo nt offic essage TO STO	should not of for work d owing shoul- ers with squ sign in eac DP sign may	be stopped for more than uring daytime hours only. d be used: uad car for flaggers. th direction. y be omitted when the post	15 min ted spe	utes. eed limit
Will the closure be less to Can you meet all require If the answer is NO, the Mini DAYLIGHT HOURS	ments approp	minutes? of Layout 8 riate station	1? ary layout must be conside Devices for 55 MPH: NIGHTTIME HOURS	ered.	
Description	Qty	Device	Description	Qty	Device
ROAD WORK AHEAD signs	2	ROAD WORK AHEAD	ROAD WORK AHEAD signs	2	ROAD WORK AHEAD
BE PREPARED TO STOP signs	2	BE PREPARED TO STOP	BE PREPARED TO STOP signs	2	PREPARED TO STOP
FLAGGER AHEAD signs	2		FLAGGER AHEAD signs	2	
Flagger and STOP/ SLOW paddle	2	ŤŤ	Law Enforcement with Squad Car	2	
			PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)	2	Changeable Nessage Sign (PCMS)

Short Duration Layouts

Short Duration - when an operation stays in one location during daylight conditions from 15 minutes to one hour, such that minimal temporary traffic control devices are deployed.

Will your operation stay in one location for less than one hour?

Is your operation during daylight conditions?

If the answer is NO, consider the use of the appropriate Short Term or Intermediate Term layout.

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Urban Temporary Traffic Control – Layout Selection by Maintenance Activity

Printing Instructions:

The supplemental guides are formatted to be printed as a booklet. The printed document is the same size as the field manual so that it can be stored within the book. In order for it to print properly, use these printing settings:

- o Landscape
- \circ 2-sided, flip on the short side (if you flip on long side $\frac{1}{2}$ of the pages will be upside down)
- Color (preferred, but optional)

Once printed, fold the entire stack of paper in half to create a booklet. Staple the seam, if available.

Temporary Traffic Control Layout Selection by Maintenance Activity

LOW VOLUME URBAN RESIDENTIAL STREET - JANUARY 2016

The intent of this document is to **help local agencies identify the appropriate work zone layout based on the maintenance activity that will be performed.** This document is intended to be used as supplemental guidance to the *Temporary Traffic Control Zone Layouts Field Manual* (dated January 2014). The information presented here does not replace or override anything within the field manual. Agencies must follow the standards and guidance contained in the Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD), including the Field Manual.



Temporary Traffic Control Zone Layouts Field Manual (dated January 2014).

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URBAN

Criteria to use this document:

- Urban Residential Street
- Low Volume (<400 ADT)
- Mobile, Short Duration or Short Term work only
- Attended work zones
- 30 mph or less

This guidance was developed to aid in selecting appropriate temporary traffic controls for maintenance work on streets commonly referred to as residential streets. While the The Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD) and Minnesota Statutes do not specifically define these streets these guidelines were developed for streets with a speed limit of 30 mph or less, that have a traffic volume less than 400 ADT, and have few if any businesses or commercial development. Many of these residential streets have limited pavement width and consideration should be given to working with local law enforcement to restrict parking on the streets where work is being planned. This will facilitate being able to provide safe passage of vehicles while providing work space exclusively for workers, equipment and materials. The MN MUTCD contains requirements to provide a minimum of 10 foot wide lanes for the passage of vehicles.

How to use this document:

- 1. Identify your maintenance activity and work duration
- 2. Use the matrix on page 3 to select a layout to consider
- 3. Find the box that corresponds with the suggested layout on the following pages.
- 4. Read the "Notes from field manual" section and the questions under the section "Is this the appropriate layout?"
- 5. If the layout is not appropriate, use the guidance provided to identify a better layout.
- 6. Once the appropriate layout is identified, use the Field Manual for guidance on how to setup the work zone in the field, and the "Minimum Required Devices" section as guidance on the minimum devices needed when using the layout.

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Layout Selection Matrix by Maintenance Activity:

		WORK DURATION			
	URBAN	MOBILE	SHORT DURATION	SHORT TERM	
	MAINTENANCE ACTIVITY	15 Minutes or less	One Hour or less	12 Hours or less	
	Asphalt pavement patching	5	8	9	
	Concrete pavement patching	-	-	9	
	Pothole patching	5	8	-	
_	Crack Filling	-	8	9, 10, 13	
road	Crack sealing - Route and seal	-	-	9, 10, 13	
0	Surface treatment	-	-	9, 10, 13	
	Sweeping - Residential	5	-	-	
	Road closure (e.g. water main break)	81	80	80	
	Utility maintenance (partial road closure)	-	-	9, 10	
	Mowing	71	-	-	
	Tree/Brush removal	5, 71	8	9, 10	
	Debris removal - routine (e.g. litter pickup)	2	2, 3	-	
adside	Debris removal - Large item (e.g. couch, roadkill)	5	-	-	
Ro	Utility repair - roadway	2, 3, 21	2, 3, 21	2, 3, 21	
	Sign repair	2, 3, 5	2, 3	-	
	Snow cleanup	2, 3, 5	3	-	
	Utility repair - intersection	-	-	28	

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Duration of Work Definitions

Since most low volume roads with less than 400 ADT are two-lane two-way streets, the first and most important decision for temporary traffic control is to ensure you select a layout with the proper duration of work. The MN MUTCD defines Duration as follows:

Duration - the length of time any work operation occupies a specific location or causes a traffic obstruction without changing the location. This time is measured from the first disruption to traffic until the total clearing of the area. The following durations are defined in overlapping intervals since Temporary Traffic Control (TTC) layouts for longer durations may always be used for shorter durations, especially when roadway attributes such as traffic volume and speed, and the work space location may warrant higher levels of traffic control.

- **Mobile** when an operation is continuously moving or stopped in one location for periods of 15 minutes or less. The traffic control devices are typically vehicle-mounted. The work area should change by at least the decision sight distance for it to be considered a change in location.
- **Short Duration** when an operation stays in one location during daylight conditions from 15 minutes to one hour, such that minimal TTC devices are deployed.
- **Short Term** when an operation stays in one location during daylight conditions from 15 minutes to twelve hours, such that advance signing and channelizing devices are required.
- Intermediate Term/Night when an operation stays in one location during daylight conditions from 15 minutes to no more than 3 days, or stays in one location during hours of darkness. Advance signing and larger channelizing devices (Type B) are required.
- **Long Term** when an operation stays in one location for more than 3 days. A project specific Traffic Control Plan is typically required.

Required Devices

Although cones are the typical channelizer for short term operations, they cannot be used in unattended work zones (Section 6F-64 of MN MUTCD). If leaving a lane closure or marking work when the workers are not present a higher level channelizer, such as a drum or barricade must be used.

LAYOUT 80					
SHORT OR INTERMEDIATE TERM	DAYLIGHT	OR NIGHTTIME HOURS			
		STREETS			
Maintenance Activities: Road closure 					
General Information: Layout 80 is for a total closure that lasts les	ss than 3 days				
 Notes from Field Manual: The Road Authority will determine if a route. Road Closure Notice sign should be in closure. Install at the last driveway or intersect access. 	detour is requ stalled seven ion beyond wl	ired and specify the detour days in advance of the nich there is no public			
Is this the appropriate layout? Will the closure be less than 3 days? Can you meet all requirements of Layout 8 If the answer is NO, a special temporary tr	0? affic control pl	an must be considered.			
Minimum Required	Devices for	30 MPH:			
Description	Qty	Device			
ROAD CLOSED TO THRU TRAFFIC or ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY signs	1	ROAD CLOSED TO THRU TRAFFIC OF ROAD CLOSED X MILES AHEAD LOCAL TRAFFIC ONLY			
ROAD CLOSED AHEAD XXX FEET sign	1	ROAD CLOSED AHEAD BOO FEET			
ROAD CLOSED AHEAD sign	1	ROAD CLOSED AHEAD			
Type III Barricade	3*				
*with enough to completely clo	ose the road a	at point of closure.			

Pedestrian Access

If an existing pedestrian route is impacted by a short-term or short-duration work zone that is attended with project personnel, establishing an alternate pedestrian route may not be necessary if the work can be stopped and pedestrians can navigate the work zone safely. Pedestrians may be delayed for a short period of time for project personnel to move equipment and material to facilitate passage. Work zone personnel may also provide assistance to the pedestrian as necessary.

If alternative pedestrian layouts are needed, Layouts 84 a&b and 85 a&b of the Field Manual should be considered.

Mobile Layouts

Since most of the speed limits on urban residential streets are 30 mph and the corresponding decision sight distance is 550 feet to meet this definition, the work space has to move at least 2200 feet per hour, or approximately 1/2 mile per hour.

Will your work move more than 550 feet every 15 minutes, or approximately 1/2 mile per hour?

If not, do not use a mobile layout and consider a stationary (short duration or short term) layout.

LAYOUT 28 **CLOSURE IN CENTER OF INTERSECTION** SHORT OR INTERMEDIATE TERM DAYLIGHT OR NIGHTTIME HOURS **ONLY FOR SPEED LIMITS USE FOR ROADS LESS THAN 40MPH OR LESS** 400 ADT ONLY **Maintenance Activities:** • Utility repair - intersection **General Information:** Layout 28 is intended for use where work is in the center of the intersection and there is adequate space for traffic to drive around the closed area. Layout 28 is not restricted to short term (daylight hours and 12 hours or less) but can be used for 3 days or less (Intermediate term). Notes from Field Manual: The minimum paved lane width from channelizing devices to the edge of the 1. pavement or to the outside edge of the shoulder shall be 10 feet. Is this the appropriate Minimum Required Devices for 30 MPH: lavout? Description Qtv Device Can traffic drive around the closed area? Has parking been restricted ROAD WORK AHEAD NOR 4 to allow for a minimum 10 sign foot lane for safe passage of vehicles? 18" cones for daytime low Can you meet all requirements speed \vdash VARIES of Lavout 28? 28" cones or other If the answer to any of these channelizing device is no, layout 29 must be considered.

LAYOUT 13 LANE CLOSURE, TWO FL	AGGER –	TWO-LANE TW	O-WAY RO	DAD
SHORT OR INTERMEDIATE	TERM	DAYLIGHT OR I	NIGHTTIMI	E HOURS
		ALL	STREETS	
Maintenance Activities:Crack fillingCrack sealing - route and seal		Surface treatme	nt	
General Information: Layout 13 is not restricted to sho be used for 3 days or less (Interr the application of Decision Sight two flaggers.	ort term (da nediate ter Distance f	aylight hours and 12 m). This layout conta or flagger location a	hours or les ains some g nd requires	s) but can uidance on the use of
 The approach sight distance Distance (D). The ONE LANE ROAD AHE is 40 mph or less. The two-way taper should be devices. 	e to the flag AD sign ma be 50 feet a	gger shall be at least ay be omitted when and using five equall	the Decision the posted the posted the posted the posted the posted character character the posted character the p	on Sight speed limit annelizing
Is this the appropriate layout?	Minim	um Required De	vices for 3	0 MPH:
Has parking been restricted to allow for a minimum 10 foot lane for safe passage of vehicles? Can you meet all requirements	ROAD \ sign	WORK AHEAD	2	ROAD WORK AHEAD
of Layout 13? If the answer to any of these is no, another layout must be considered	FLAGGE	ER AHEAD sign	2	
	Flagger paddle	and STOP SLOW	2	ŤŤ
	18" con speed 28" con channeli	es for daytime low es or other zing device	15*	
	*with a	n additional device	e for every §	50 feet of

LAYOUT 5 LANE CLOSURE - TWO LANE TWO) WAY ROAD	
MOBILE	Daytime all speeds Nighttime 40 mph or less	
WORK IN TRAVELED LANE RESIDENTIAL STREET	USE FOR ROADS LESS THAN 150 ADT ONLY	00
Maintenance Activities:Asphalt pavement patchingPothole PatchingSweeping - Residential	 Tree/brush removal Debris removal - Large item (e.g. couch, roadkill) Sign repair Snow cleanup 	
General Information: Layout 5 covers most of the mobile applica conducted on the traveled lanes. This layou roadways with posted speed 40 mph or les	tions for residential street where work is t may be used for night time operations s.	s for
 Notes from Field Manual: If the approach sight distance is restricted, a spotter should be used to protect the work area and to warn the driver. If the visibility is poor or the 	Minimum Required Devices for 3 MPH: There are no minimum required device The STANDARD that applies is: Mobile operations shall have appropriat devices on the equipment (that is, high	30 :s. te
operation does not move at least the Decision Sight Distance (D)every 15 minutes, the appropriate stationary layout should be used.	intensity rotating, flashing, oscillating, oscillating, oscillating, oscillating, or shall use a separate vehicle with appropriate warning devices.	or ,
nightime operations only in locations where the posted speed limit is 40 mph or less.	Description Qty Devic	ce
 The slow moving or stopped work vehicle should keep the traffic lane as wide as possible by using the shoulder space whenever possible. 	Light 1	
Is this the appropriate layout? Can you meet all requirements for Layout 5 of the Field Manual? Has parking been restricted to allow for a		
minimum 10 foot lane for safe passage of vehicles?		
It the answer is NO, the appropriate stationary layout must be considered.		

LAYOUT 71

WORK OFF ROADWAY MOBILE OPERATIONS HAVING LITTLE OR NO INTERFERENCE WITH TRAFFIC

NO INTERFERENCE WITH TRAFFIC				
MOBILE	DAYLIGHT H	OURS		
LITTLE OR NO INTERFERENCE WITH TRAFFIC	ALL RESIDENTIA	L STRE	ETS	
Maintenance Activities: Mowing 	• Tree/brush removal			
General Information: Layout 71 is for work that is off the roadwa with traffic. This layout can be used for all s	y where there is little or not traffic strategies of traffic	o interfe volum	erence	
Notes from Field Manual:				
 The operations should be scheduled a and have little or no interference with during periods of poor weather or visit 	nd completed during daylig traffic. The work should be pility.	ght wor suspe	[.] k shifts nded	
 All vehicles shall be equipped with a flashing vehicle light visible 360-degrees around the vehicle when viewed from a distance of 60 feet. 				
 The ROAD WORK AHEAD sign may be omitted when there is an adequate approach decision sight distance to the equipment along the majority of the route. 				
 When advance warning signs are used miles from the work vehicle. The locat the sources of traffic, such as major cl 	d, the signs should be no r ion of the signs should be ross roads.	nore th determ	an 3 1ined by	
 On roadways where decision sight dis must encroach into the traffic lane rou shown. 	tance is restricted and the tinely, a shadow vehicle m	equipr ay be ι	nent Jsed as	
Is this the appropriate layout? Is your work area off the roadway with little or no interference with traffic? Has parking been restricted to allow for a minimum 10 foot lane for safe passage of vehicles? Can you meet all requirements of Layout 71?	Minimum Required MPH: All vehicles shall be equi flashing vehicle light visil around the vehicle when distance of 60 feet. A SLOW MOVING vehicl for all slow moving vehic	Device pped w ole 360 viewed le sign i les ope	es for 30 with a -degrees d from a is required erating on	
If the answer to any of these is NO, the appropriate stationary layout must be considered.	public roadways. Description	Qty	Device	

Flashing Vehicle Light

SLOW MOVING sign

1

1

SHORT OR INTERMEDIATI	ETERM	DAYLIGHT OR NIG	HTTIME	HOUR
500 FEET MAXIMUM WORK	(SPACE	USE FOR ROADS ADT C	LESS TH DNLY	IAN 400
Maintenance Activities: Crack filling Crack sealing - route and seal 		Tree/brush removalSurface treatmentUtility maintenance		
General Information: Layout 10 has a maximum work roadways with <400 ADT. Layo and 12 hours or less) but can be layout contains some guidance flagger location and whether a s	space is 50 ut 10 is not used for 3 on the appl second flage	00 feet and it is restrictor restricted to short term days or less (Intermedi ication of Decision Sigh ger is required.	ed to use n (dayligh ate term) t Distanc	on t hours . This e for
 Notes from Field Manual: The approach sight distance Distance (D). If the flagger's ability to see than the Decision Sight Dis STOP signs shall be installe see Layout 20. 	e to the flag e oncoming stance, two ed if the wo	gger shall be at least the motorists beyond the flaggers shall be used rk space must be left u	e Decision work space - See Lay nattendec	n Sight ce is les out 13. d at nigh
4. The two-way taper should l channelizing devices.	be 50 feet i	n length using 5 equally	/ spaced	
Is this the appropriate layout?	Minim	ium Required Devic	es for 3	0 MPH:
Is the work space less than 500 feet long? Will traffic be able to be controlled by a single flagger?	ROAD W	/ORK AHEAD signs	2	ROAD WORK AHEAL
Has parking been restricted				
Has parking been restricted to allow for a minimum 10 foot lane for safe passage of vehicles?	FLAGGEI	R AHEAD signs	1	
Has parking been restricted to allow for a minimum 10 foot lane for safe passage of vehicles? Can you meet all requirements of Layout 10? If the answer to any of these is no, layout 13 must be experienced	FLAGGEI Flagger a	R AHEAD signs	1	

LAYOUT 9 LANE CLOSURE, NO FLAGGER – T	WO-LANE TWO-WAY	ROAI	D
SHORTTERM	DAYLIGHT H	OURS	
500 FEET MAXIMUM WORK SPACE	USE FOR ROADS LE ADT ON	SS TH	AN 400
Maintenance Activities:Asphalt pavement patchingConcrete pavement patchingCrack filling	 Crack sealing-route an Tree/brush removal Surface treatment Utility Maintenance 	d seal	
General Information: Layout 9 has a maximum work space length hours and 12 hours or less) application. The when traffic is unable to self-regulate include	h of 500 feet and is for sh re is not specific guidance ded in this layout.	ort terr e on de	n (daylight termining
Notes from Field Manual:			
 When traffic cannot regulate itself thro Layout 10. 	ough the length of the wor	'k spac	e, use
2. STOP signs shall be installed if the wo see Layout 20.	rk space must be left una	tendec	l at night -
3. The two-way taper should be 50 feet in channelizing devices.	n length using 5 equally sp	baced	
Is this the appropriate layout? Is the work space less than 500 feet	Minimum Required MPH:	Device	es for 30
Will traffic be able to self-regulate	Description	Qty	Device
without the use of a flagger? Has parking been restricted to allow for a minimum 10 foot lane for safe passage of vehicles?	ROAD WORK AHEAD signs	2	ROAD WORK AHEAD
Is the work during daylight hours? Can you meet all requirements of Layout	18" cones for daytime	15*	
9? If the answer to any of these is no	low speed		
Layout 10 must be considered.	*Minimum number of foot work space	cones t ce is 24	for a 500

TEMPORARY ROAD	CLOSURE	– ти	O LANE TWO WAY R	OAD	
MOBIL	E		DAYLIGHT OR NIGHT	TIME	HOURS
TOTAL CLOSURE 15 LESS	MINUTES	OR	ALL ROADW	IAYS	
Maintenance ActivitRoad closure	ies:				
General Information Layout 81 is for a total c	: losure that la	ist less	than 15 minutes		
 Notes from Field Ma The traffic from bot Conditions represent For night closures, and the end of the e	h lanes shou hted are for v the following ent officers w nessage sign TO STOP sig te layout?	Ild not work d shoul vith squ in eac gn may	be stopped for more than uring daytime hours only. d be used: uad car for flaggers. h direction. be omitted when the post	15 min ted spe	utes. eed limit
Will the closure be less than 15 minutes? Can you meet all requirements of Layout 81? If the answer is NO, the appropriate stationary layout must be considered.					
Minimum Required Devices for 30 MPH:					
Description	Oty Dev	vice		Otv	Device
ROAD WORK AHEAD signs	2 RO.	AD RRK AD	ROAD WORK AHEAD signs	2	ROAD WORK AHEAD
FLAGGER AHEAD signs	2		BE PREPARED TO STOP signs	2	PREPARED TO STOP
Flagger and STOP/ SLOW paddle	2	i l	FLAGGER AHEAD signs	2	
	i		Law Enforcement with Squad Car	2	
			PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)	2	CHRNGERBLE Message Sign (PCMS)

LAVOUT 01

Short Duration Layouts

Short Duration - when an operation stays in one location during daylight conditions from 15 minutes to one hour, such that minimal TTC [temporary traffic control] devices are deployed.

Will your operation stay in one location for less than one hour?

Is your operation during daylight conditions?

If the answer is NO, consider the use of the appropriate Short Term or Intermediate Term layout.

SHORT OR INTERMEDIATE TERM	DAYLIGHT OR NIGHTTIME HOURS
PARKING LANE	ALL STREETS (NO LIMIT ON ADT)
Maintenance Activities: Utility repair - roadway Sign repair 	Snow cleanupDebris removal-routine
General Information: Layout 3 is for work on the parking lane for and highways. Even so, the requirements a make it appropriate for off roadway operation restricted to short term (daylight hours and days or less (Intermediate term).	all types, speeds and volumes of streets and options presented in this layout ons on residential streets. Layout 3 is not 12 hours or less) but can be used for 3
 Notes from Field Manual: This layout is intended for use where a lane is normally open to vehicle travel be in effect, the lane shall be consider. The appropriate layout shall then be us closure. 	a parking lane is closed. If this parking during the time of day this closure will ed a traveled lane and not a parking lane. sed to provide traffic control for the lane
Is this the appropriate layout? Has parking been restricted to allow for a	Minimum Required Devices for 3 MPH:
Is this the appropriate layout? Has parking been restricted to allow for a minimum 10 foot lane for safe passage of vehicles?	Minimum Required Devices for 3 MPH:DescriptionQtyDevice

ICCEDEN CECCONE WONK ON C		n		VO-LANE TWO-WAY	KOAL
HORT OR INTERMEDIATE TERM	DAYLIGHT OR NIG	GHTIME HOURS	SHORT DURATION	DAYLIGHT H	IOUR
OFF TRAVELED ROADWAY	ALL ROADWAYS				
Maintenance Activities:	Sign repair		50 foot MAXIMUM WORK SPACE	OSE FOR ROADS LE ADT ON	SS TH ILY
pickup) • Utility repair - roadway	 Snow cleanup 		Maintenance Activities:	Crack filling	
General Information:			Asphart pavement patchingPothole patching	Tree/brush removal	
volumes of streets and nignways. Even so, the layout make it appropriate for many shoulder a roadways. This layout is for use on rural design has ditches, and there is a shoulder present. In curb and gutter and parking lanes, you must c Section). Layout 2 is not restricted to short ter can be used for 3 days or less (Intermediate te	e requirements and optio and off roadway operatior ns where there is no curb f your work area is in an u onsider use of Layout 3 (I rm (daylight hours and 12 erm).	ins presented in this as on low volume and gutter, typically urban design with Intermediate Term hours or less) but	Layout 8 has a maximum work area length time restriction, limits the use of this layou specific guidance on determining when tra this layout.	of 50 feet which, along w t to very specific work typ ffic is unable to self-regula	rith the bes. The ate inc
Notes from Field Manual:			1. The work vehicle shall not be parked of	on the shoulder opposite of	of the c
 All signs, barricades and channelizing dev occupies an isolated shoulder location fo interference with traffic. 	vices may be omitted whe r less than one hour and i	en the work it has little or no	2. The hagger and the Flagger Ahead sy volumes do not restrict traffic's ability work space.	to regulate itself through	the ler
2. An operation which moves between wor	k spaces that are less that	an the decision sight	3. The two-way taper should be 50 feet channelizing devices.	n length using 5 equally s	paced
3. The ROAD WORK AHEAD sign may be o	mitted for short term day	light operations if:	Is this the appropriate layout?	Minimum Required	Devi
a. the distance from curb face to the w	vork space is at least 2 fee	et, or	hour or less?	MPH:	
 b. the distance from the edge of the ro and a vehicle displaying a 360-degree 	adway to the work space e flashing beacon is opera	e is at least 15 feet ating.	Has parking been restricted to allow for a	Description	Qty
 This ROAD WORK AHEAD sign shall be i control devices are installed for a work sp 	nstalled on 2-lane, 2-way pace in the opposite shou	roads if traffic ulder.	vehicles? Can you meet all requirements of Lavout	ROAD WORK AHEAD signs	2
Is this the appropriate layout?	Minimum Required D	Devices for 30 MPH:	8?		—
traveled lanes?	with little or no interferen	ce with traffic.	appropriate short term stationary layout	FLAGGER AHEAD	1
Has parking been restricted to allow for a minimum 10 foot lane for safe passage of	For all other conditions:		must be considered.	signs	
vehicles?	Description	Qty Device			
Can you meet all requirements of Layout 2?	ROAD WORK	1 or 2 Road		SLOW paddle	1
If the answer to any of these is NO, the appropriate short term stationary layout must be considered.	AHEAD signs	I OF 2		18" cones for daytime low speed	10
If your work area is in an urban design with curb and gutter and parking lanes, you must consider use of Layout 3 (Intermediate Term Section).	18" cones for daytime low speed			28" cones or other	
	28" cones or other channelizing device	6*			<u> </u>
	*with an additional ch	nannelizer for everv			

LAYOUT 21 EQUIPMENT ON CENTERLINE – TWO-LANE TWO-WAY ROAD							
SHORT DURATION	DAYLIGHT HOURS						
RESIDENTIAL STREET 50 foot MAXIMUM WORK SPACE	USE FOR ROADS LESS THAN 1500 ADT ONLY						
Maintenance Activities: • Utility repair - roadway							
General Information: Layout 21 has a maximum work area length of 50 feet which, along with the one hour time restriction, limits the use of this layout to very specific work types.							
 The work vehicle shall be parked off of the roadway. Do not obstruct the shoulder in the coned areas. The flagger and Flagger Ahead sign may be omitted if there is at least 10 feet of roadway and shoulder available to safely pass the work equipment on the centerline of the roadway. Is this the appropriate layout? 							
Has parking been restricted to allow for a minimum 10 foot lane for safe passage of vehicles?Can you meet all requirements of Layout 21?If the answer to any of these is NO, the appropriate short term stationary layout must be considered.	Description	Qty	Device				
	ROAD WORK AHEAD signs	2	ROAD WORK AHEAD				
	FLAGGER AHEAD signs	2					
	Flagger and STOP SLOW paddle	2	ŤŤ				
	18" cones for daytime low speed 28" cones or other channelizing device	20					

Short Term Layouts

Short Term - when an operation stays in one location during daylight conditions from 15 minutes to twelve hours, such that advance signing and channelizing devices are required.

Will your operation stay in one location for less than 12 hours?

If the answer is NO, consider the use of the appropriate Intermediate Term layout.

Many of the short term layouts in the field manual are also intermediate term layouts which can remain in place for up to three days and during night time conditions. For these situations remember cones cannot be used in unattended work zones. Letter to the MUTCD Committee



April 12th, 2016

Janelle Anderson MnDOT Tort Claims & Standards Engineer 1500 W. Co. Rd. B2 Roseville MN 55113

SUBJECT: Recommendations for Consideration by the Minnesota Committee on Uniform Traffic Control Devices to Revise the Minnesota Manual on Uniform Traffic Control Devices for Temporary Traffic Controls on Low Volume Streets and Highways

Dear Ms. Anderson,

The Minnesota Local Road Research Board (LRRB) recently established a Technical Advisory Panel to address the concerns of local agencies regarding temporary traffic control guidelines outlined in the Minnesota Manual on Uniform Traffic Control Devices Field Manual. A goal of the TAP was to make recommendations to the Minnesota Committee on Uniform Traffic Control Devices to revise the Field Manual, specifically *Part K Temporary Traffic Control Zone Layouts*. The recommendations are aimed to assist local agencies in providing improved and safer temporary traffic controls for their maintenance operations.

The TAP has determined that many layouts within the manual contain unnecessary and sometimes excessive requirements for applications — specifically for lower volume local road systems with unique design and traffic characteristics. In addition, the temporary traffic control layouts contained in the manual are biased toward the experience and needs of MnDOT, focusing on high volume, high speed Trunk Highways. While it is necessary to address the various temporary traffic control needs for a statewide transportation system, it results in a difficult and time consuming effort for local road authority field operations personnel to determine the appropriate layouts and standards that are needed for their project.

The TAP would appreciate the MCUTCD to consider revisions to the MN MUTCD and Temporary Traffic Control Zone Layouts, Field Manual. These include:

- Application of channelizing devices on low volume roads.
- Refining requirements and device spacing on low volume low speed residential streets.
- Providing a new section in the Field Manual for low volume rural highways.

Application of Channelizing Devices

The guidance and standards for the application of channelizing devices in the MN MUTCD are applicable to all roadways and all temporary traffic control zones regardless of traffic speed, traffic volume, and roadway design. The LRRB Task Force recommends that the MCUTCD consider developing guidance for inclusion in PART 5. TRAFFIC CONTROL DEVICES FOR LOW VOLUME ROADS, Chapter 5G. Temporary Traffic Control Zones that allow for the completion of short-term work (up to 12 hours) on low volume (<400 ADT) roadways without channelizing devices where the work space is short, vehicle paths are clearly visible, work space is frequently moving, and risk to workers and the traveling public is not compromised.

To accomplish this the following language is recommended for inclusion in **Chapter 5G.3 Channelization Devices**:

Option: (existing language)

To alert, guide and direct road users through temporary traffic control zones on low volume roads, tapers may be used to move a road user out of the traffic lane and around the work space using the spacing of devices that is described in Section 6F.58.

Option: (new language)

Short-term daylight hour maintenance operations that typically have short work spaces, clearly visible vehicle paths and offer limited risk to workers and road users may omit the routine use of channelization devices. Channelization devices may also be omitted if flaggers give specific instructions to drivers on how to proceed through the work zone.

Guidance: (new language)

Channelization devices should be used if road users should be guided in a clear and positive manner while approaching and within construction, maintenance, and utility work areas.

Low Volume Low Speed Residential Streets

• The MN MUTCD defines Roadway as, "that portion of a highway improved, designed, or ordinarily used for vehicular travel and parking lanes, but exclusive of the sidewalk, berm, or shoulder even though such sidewalk, berm, or shoulder is used by persons riding bicycles or other human-powered vehicles. In the event a highway includes two or more separate roadways, the term roadway as used in this Manual shall refer to any such roadway separately, but not to all such roadways collectively." This definition results in parking lanes being a portion of the roadway where shoulders are not. It is recommended that the MCUTCD consider revising Layout 3 of the Field Manual to include Note 1 from Layout 2 that, "All signs, barricades and channelizing devices may be omitted when the work occupies

an isolated parking lane location for less than one hour and it has little or no interference with traffic."

• The values used in the Temporary Traffic Control Distance Charts for low speed roadways are far greater than those contained in the federal MN MUTCD. For example, advance sign spacing in the Minnesota charts for a 30 mph speed limit is 250 feet while the federal MUTCD uses 100 feet. The MN MUTCD allows 100 foot spacing but requires the use of engineering judgement to apply this value. The Minnesota chart value is difficult to apply in an urban situation where block lengths are 200-400 feet. Also, there are not many situations included that provide guidance on how to adjust sign spacing and location or taper length or placement based on the vicinity of intersections, entrances or pedestrian or bike facilities often present in urban environments. In addition, Part 5G of the MN MUTCD includes the use of 100 feet minimum spacing for 30 mph roadways, but excludes built up urban areas and residential streets from using this value.

Posted Speed Limit Prior to Work Starting (mph)		Advance Warning Sign Spacing (A) feet		
0-30	G = 25 ft	< 400 ADT All Other Roads	100 250	
35-40		325		

The following is recommended for inclusion in the Temporary Traffic Control Distance Charts contained in the Field Manual of the MN MUTCD:

• Layout 71 contains the note, "the signs should be no more than 3 miles from the work vehicle." This is essentially a rural, high-speed highway requirement; however, it applies to all roadways. This is based on the signs not being more than 3 minutes away; however, in a residential environment, this time may be inappropriate and too long due to visual clutter and other distractions in the urban environment. It is recommended that the MCUTCD consider revising note 4 to read:

4. When advance warning signs are used, the signs should be no more than 3 miles from the work vehicle on high-speed roadways and no more than 1 mile on low-speed roadways. The location of the signs should be determined by the sources of traffic, such as major cross roads.

• Layout 81 appears to apply to higher volume, higher speed roadways and the number of devices and personnel needed for a short 15 minute closure on a low volume low speed residential street is excessive. Consideration by the MCUTCD of allowing a reduction of devices, personnel and requirements for these residential streets is recommended. It is recommended to include the following note on Layout 81:

5. For streets with speeds 30 mph or less, less than 400 ADT, and few businesses or commercial development, the flagger ahead sign may be omitted and for night closures, the changeable message sign in each direction and law enforcement officers may be omitted.

• The LRRB Task Force recommends that the MCUTCD consider providing reduced spacing requirements for urban environments in the distance charts and to also consider inclusion of more layouts to provide guidance for adjusting temporary traffic controls to meet the needs for local agencies while deploying adequate temporary traffic controls. This guidance should include adjustments for work zones in the vicinity of intersections and entrances, presence of pedestrian and bicycle facilities and traffic, and street classification and use, i.e. collector, residential, etc.

Low Volume Rural Highways

The applications and layouts for low volume rural highways are scattered throughout the Field Manual. To facilitate use by local authorities, the Task Force recommends including a separate section in the Field Manual for low volume rural highways. This section would contain the existing Layouts 8, 9, 10, 11, 20, 21, 23, and 72. Since most of these rural highways have statutory speed limits of 55 mph and many are not posted, the Task Force also recommends showing distances directly on the layouts rather than referring to the device spacing charts. It is further suggested that all optional devices be removed from the layouts. Figure 1 shows these recommendations applied to the existing layouts 9 and 10.

Questions regarding these requests and recommendations may be directed to Mark Vizecky, MnDOT State Aid Safety Engineer, 651-366-3839, or <u>mark.vizecky@state.mn.us</u>.

Sincerely,

Jim Grothaus University of Minnesota LTAP Director and TAP Chair Mark Vizecky MnDOT State Aid Program Support Engineer

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LRRB Task Force Members:

Jim Grothaus (chair), U of M LTAP	Victor Lund, St. Louis County
Janelle Anderson, MnDOT Tort Claims	Russ Matthys, City of Eagan
Nick Anderson, Big Stone County	Sue Miller, Freeborn County
Lon Aune, Marshall County	Dan Sauve, Clearwater County
Marc Briese, Stonebrooke	Kathleen Schaefer, CTAP
Janelle Borgen, WSB	Ted Ulven, MnDOT
Bruce Holdhusen, MnDOT RSS	Mark Vizecky, MnDOT State Aid
Ken Johnson, MnDOT	Mike Marti, SRF Consulting Group
Paul Kauppi, City of Woodbury	Renae Kuehl, SRF Consulting Group
Tom Knakmuhs, Norman County	Jon Jackels, SRF Consulting Group



Figure 1 – Recommendation Examples

Work Zone Safety - Training and Resources

Work Zone Safety - Training and Resources

A variety of work zone safety training options and resources are available to local agencies. Below is a summary of a few current resources that were available at the time of publication, however it this is not a comprehensive list.

MnDOT

MnDOT's work zone website includes manuals, guidelines, checklists, specifications and technical memorandums related to work zones.

http://www.dot.state.mn.us/trafficeng/workzone/

- <u>Work zone safety campaign</u> construction zone and safety information and safe driving tips
- <u>Work Zone Safety Awareness Program</u> A free program involving work zone safety issues presented throughout the state by MnDOT personnel or Drivers Education and 55 Alive instructors.
- <u>Work zone safety tools</u> Manuals, handbooks, and other guidelines related to standards and safety within work zones on Minnesota roadways.
- <u>Work zone training courses</u> Training Courses conducted by MnDOT
- Work zone safety committees

Minnesota Local Transportation Assistance Program (LTAP)

The Minnesota LTAP hosts two work zone related training courses that are detailed below.

Work-Zone Safety, Temporary Traffic Control, and Flagging Training (In Person Training) http://www.mnltap.umn.edu/training/topic/traffic/workzone-safety/

In this four-hour comprehensive workshop, attendees will learn key elements required for temporary traffic control, safety, and flagging.

Work-Zone Safety Tutorial (Online training)

http://www.mnltap.umn.edu/training/online/workzone/index.html

This tutorial offers a convenient opportunity for new, seasonal, or temporary staff to learn about the fundamentals of work-zone safety and the basic concepts of the work-zone area before arriving at the job site. This tutorial addresses many of the hazards inherent in road and street work and how these dangers can be minimized to keep motorists, pedestrians, and employees safe.

American Traffic Safety Services Association (ATSSA)

Work Zone Safety Training Grant

ATSSA partnered with the Federal Highway Administration (FHWA) to offer a number of work zone safety training courses to state and local governments and transportation agencies at a low cost of \$25 per course, per participant. Details about the courses and registration information can be found at the following link. <u>http://www.atssa.com/WorkZoneSafetyGrant</u>

The courses "TCT – Traffic Control Technician" and "TCS – Traffic Control Supervisor" have been modified to MNMUTCD standards.

Work Zone Safety App

www.workzonesafety.org

ATSSA has recently released a Work Zone Safety App for use on smart phones. Users should note that this application is based on federal standards and does not include Minnesota standards.