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Remarks and Instructions

The complete manual, revision packages, and individual chapters can be accessed at www.wsdot.wa.gov/publications/manuals/m51-02.htm.

For updating printed manuals, page numbers indicating portions of the manual that are to be removed and replaced are shown below.

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Appendix 5B Speed Limit Reductions In Work Zones	5.B-1 – 5.B-16	5.B-1 – 5.B-10

Please contact Steve Haapala at 360-705-7241 or HaapalS@wsdot.wa.gov with comments, questions, or suggestions for improvement to the manual.

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Washington State Department of Transportation Traffic Operations Division PO Box 47344 Olympia, WA 98504-7344

Approved By	Signature



Traffic Manual

M 51-02.08

July 2015

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Washington State Department of Transportation Traffic Operations PO Box 47344 Olympia, WA 98504-7344 www.wsdot.wa.gov/operations/traffic The *Traffic Manual* is intended to provide instruction and guidance to department personnel who conduct traffic operations and design activities. This manual identifies state and federal laws and departmental directives, policies and publications that are used to aid in decision making for traffic operations and design issues. It also provides standards to assure uniform application of operational methods and traffic control devices statewide.

Updating the *Traffic Manual* is a continuing process and revisions are issued periodically. Questions, observations and recommendations are invited. The next page is provided to encourage comments.

/s/ John Nisbet

John Nisbet State Traffic Engineer

Comment Form

From:	Date: Phone:
To:	WSDOT Traffic Engineer Transportation Building PO Box 47344 Olympia, WA 98504-7344
Subject:	Traffic Manual Comment
	Comment (marked copies attached):

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WSDOT Traffic Manual M 51-02.03 October 2009

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Appendix 5B Speed Limit Reductions In Work Zones

I. Introduction

It is the department's policy to design highway work zones to operate at the existing regulatory speed limit. Certain work zone design or roadway conditions may require and justify a need for a regulatory speed limit reduction or advisory speed signing (Executive Order E 1060).

It is important to be consistent in implementing speed limit reductions to maintain credibility with roadway users throughout the state. This Appendix provides guidance to determine the need for a work zone speed limit reduction. Also included is the speed limit reduction worksheet and examples of a notice of speed limit reduction, speed reduction request, and traffic control plans including reduction signing.

Work Zone Speed Limit Reductions

Following are the speed reduction types and examples of appropriate use:

Advisory Speed Reduction – where drivers encounter work zone conditions (such as rough road, bump, grooved pavement, minor geometric revisions, or lane shifts) that require a specific safe speed message, a sign warning of the actual condition with an appropriate advisory speed is installed.

Variable Regulatory Speed Limit Reduction – effective only when a temporary traffic control operation (such as daily lane closures with workers on foot close to live traffic or daily lane closures with a shifting of traffic partially onto a shoulder) justifies a lower operational speed.

Continuous Regulatory Speed Limit Reduction – a speed reduction effective 24 hours a day for the duration that a work zone condition exist (such as placing traffic on temporary alignments that can't be designed for the exiting speed limit, use of temporary signals or loose gravel conditions during BST projects).

To avoid multiple different speed zones in a short section of a highway, it may be necessary to extend an adjacent lower speed zone to encompass a work zone. This can reduce driver confusion and improves credibility and compliance with the lowered speed limit.

II. Guidance

Any decision to implement a reduced speed limit must be assessed and justified as part of the Transportation Management Plan (TMP). Strategies that do not require a speed limit reduction should be selected unless exceptional constructability issues would be encountered or public/worker safety concerns would be too great.

When considering a speed limit reduction remember that drivers generally do not slow down until there is a perceived reason to do so. If motorists do not see the reason for a reduced speed limit, it is often ignored. Also consider:

- A "Reduced Speed Limit" sign is not automatically noticed or effective in slowing traffic. Most drivers determine their speed by observing visual cues from their surroundings, including the visible work activity, specific warning signs, pavement markings, and other traffic control devices.
- Studies show that drivers slow down more in work zones with PCMS's, electronic driver feedback signs ("Your Speed Is XX") and flashing warning lights. These devices used at locations were speed limit compliance is most important could be considered.
- Most drivers do not voluntarily reduce their speed more than 10 MPH unless law enforcement is active.
- Speed limit reductions of more than 10 MPH can create a wider speed differential between vehicles causing an unstable traffic flow.

Worker exposure and driver confusion may be minimized through effective traffic control strategies that do not include speed limit reduction signing.

Reduce Worker Exposure by:

- Use of a pilot car for two lane paving operations effectively controls traffic speed past workers.
- Providing positive protection devices such as Temporary Barriers and Truck Mounted Attenuators.
- Providing greater lateral buffer space between workers and traffic by closing additional lanes and/or shifting traffic laterally away from the work area. A half to full lane width is an acceptable lateral buffer for high speed conditions.
- Using closely spaced drums or tall channelizing devices to improve work area separation and motorist guidance.
- Including warning devices such as temporary rumble strips, Portable Changeable Message Signs (PCMS) or an Automated Flagger Assistance Device (AFAD), may improve flagger protection.
- Considering occasional law enforcement presence to reinforce the existing speed limit.
- Consider use of electronic driver feedback signs and elevated fines in work zone signing.

Reduce Driver Confusion by:

- Providing clear, accurate and current advanced warning information
- Delineate a clear path of travel through the work zone.
- Remove existing pavement markings that conflict with temporary alignments.
- Using enhanced pavement markings and traffic control devices.
- Minimize decision point conflicts.
- Design effective merge and diverge areas.
- Use of overhead signing when possible.
- Consider additional advance warning or guidance for complex TTC operations. (Use existing VMS or HAR systems)
- Including temporary illumination.

Work Zone Speed Reduction Assessment Factors

Certain work zone impacts and TMP strategy selections may create the need for a speed limit reduction. **These strategies must be justified as the best option in addressing an impact.** The following work zone conditions may justify requesting a type of speed limit reduction.

Roadway Geometric Changes

- Freeway lanes will be 11 feet wide or less with minimal shy distance to existing or temporary barriers.
- Shoulders will be less than 4 feet wide.
- Temporary road approaches or intersections that change roadway or roadside environment.
- Interchange ramps will have reduced merge areas or acceleration/ deceleration lanes.
- Temporary alignments that must be designed for speeds below the existing limit.
- Sight distance restrictions due to traffic barriers, temporary alignments, or intersection locations.

Roadway Condition Changes

- Roadway surface is rough or uneven.
- Loose gravel from BST operations.
- Abrupt lane edges, grooved pavement etc.

Operational Conditions on High Speed Highways

- Work operations will be during hours of darkness.
- Unprotected equipment, materials and workers will be within a lane width of traffic.
- Temporary traffic control signals will be used. (Bringing traffic to a stop and alternating in a single lane on possibly a narrowed temporary alignment usually will justify a reduction in speed)
- Haul vehicles leaving and entering the highway.

Speed Limit Reduction Assessment Examples

The following are examples of common work zone situations where a speed limit reduction may be appropriate:

Situation: 70 MPH Freeway - Long Term Construction Project

Work zone strategies often include:

- Long duration narrowing of lanes with reduced shoulders
- Temporary Concrete Barrier 2 feet or less from the lane edge
- Work hour lane closures and shifts
- Work operations which create driver distractions
- Grooved, uneven pavement or abrupt edges present during non-work hours.

Consider a Continuous Regulatory Speed Limit Reduction of 10 MPH for the above conditions.

Situation: 60 MPH Two Lane Highway - Paving Project

Daily work zones often create:

- Limited opportunities to use positive protection devices to protect workers and separate the work operation from traffic
- Flaggers exposed to high speed traffic

Consider a variable regulatory speed limit reduction to 40 MPH or lower during working hours. Note that use of a pilot car operation will effectively control traffic speeds through the work zone so a variable speed limit reduction may be unnecessary.

III. Speed Limit Reduction Approvals and Notices

The following are the steps to request a work zone speed limit reduction and provide required notices of the reduction.

- 1. The **project manage**r submits a "Speed Reduction Request" memorandum to the Region Administrator, through the Region Traffic Engineer (Figure 5B-3). A request also includes:
 - A completed "Speed Limit Reduction Worksheet" (Figure 5B-1). A justification statement must be included for approval.
 - A "Notice of Speed Limit Reduction" for approval and publishing (Figure 5B-2). (the notice is not required for advisory reduction requests)
 - The Traffic Control Plan(s) including speed limit reduction signing.
 - Other relating documents (if any) such as enforcement assistance agreements.
- 2. The **Region Traffic Engineer** (RTE) reviews the speed limit reduction request documents and will:
 - Sign the worksheet with concurrence or disapproval.
 - With a concurrence for a regulatory reduction, The RTE will forward the request to the Region Administrator with a recommendation for approval.
 - A concurrence of an advisory reduction request finalizes the approval and reduction may be implemented without further notices.
 - Approve the traffic control plan.

- 3. The **Region Administrator** approves by signing the Speed Reduction Request Memorandum and the Notice of Speed Limit Reduction. The **State Traffic Engineer** may be required to approve certain speed limit reduction requests per Executive Order E 1060.01 Section III B.
- 4. Once approved, The **RTE** or **Project Manager** shall send a notice to the Headquarters Traffic Office of a regulatory speed limit reduction. Notice is sent by memorandum or email with a copy of the approved speed limit reduction work sheet. A notice to the District Office of the Washington State Patrol is also required for any regulatory speed limit reduction. Notice is sent by memorandum and will include the types of reductions, approximate dates, and any plans to coordinate speed enforcement.
- 5. The **Project Engineer** will have the "Notice of Speed Limit Reduction" published in a local newspaper at least three days in advance of posting reduced speed limit signing. The regulation does not take effect without this public notice. (see RCW 47.48.020). A follow up notice to the WSP is required to confirm dates or other details.

Resources

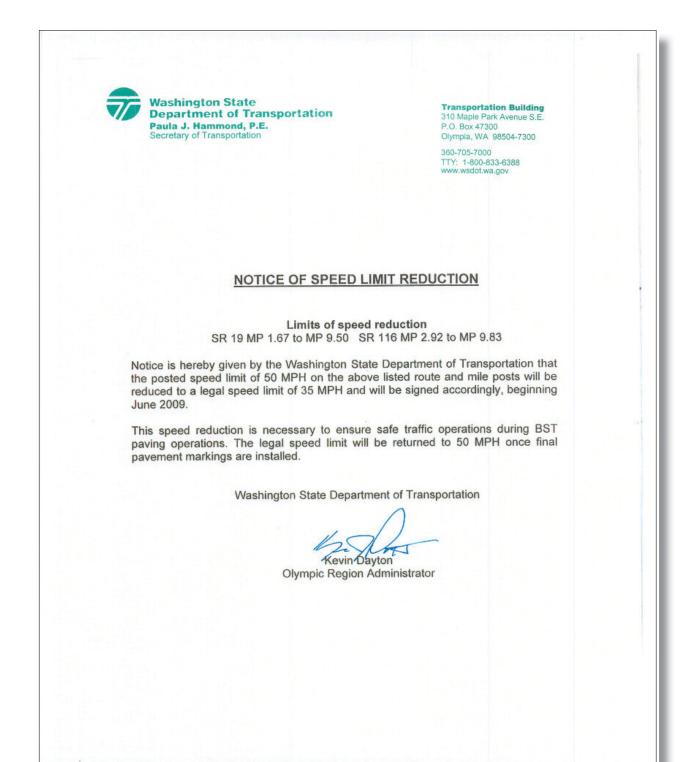
- WSDOT Traffic Manual M 51-02
- Revised Code of Washington RCW 47.48
- WSDOT Work Zone Traffic Control Guidelines for Maintenance Operations M 54-44
- WSDOT *Design Manual* M 22-01
- WSDOT Maintenance Manual M 51-01
- WSDOT Construction Manual M 41-01
- Federal Regulations 23 CFR Part 630 Subpart J
- Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) FHWA

Contacts

- · Region Traffic Office
- HQ Traffic Office

(Re	стог ю ттаунс маниан спарт	ter 5, Appendix 5B for guidance)
Date:	SR:Work Order	/Contract Number:	
Project Name:			
Existing Condition	<u>ons</u>		
Posted Speed Lim	nit:ADT:		
Number of lanes:	Lane Width:	Shoulder Width:	
Type of Speed Li	imit Reduction Proposed:		
☐ Continuous ☐	Variable Advisory		
Proposed Speed L	Limit:Duration	n for Speed Reduction:	
Work Operation for	or proposed reduction:		
Mile Post Limits f	for reduction:		
Vork Zone Cond	ditions Specific to Speed Ro	eduction Request:	
raffic Safety Con	nditions:		
Vorker Safety Co	onditions:		
Bicycles, Pedestria	ans, Others:		
Work Zone Action	ns Considered?		
☐ Speed Study	☐ WSP Enforcement		
☐ Vicinity map an	nd Traffic Control Plan attac	hed	
Justification staten	ment for speed reduction:		
	Concurrence:		
		Disapproval:	
Figure 5.B-1.doc If additional space	e is necessary for responses,	attach a supplemental sheet	

Speed Limit Reduction Worksheet Figure 5.B-1



Example Notice of Speed Limit Reduction Figure 5.B-2



Memorandum

Date

EXAMPLE

TO: Regional Administrator

THRU: Regional Traffic Engineer

FROM: Title/Project manager

SUBJECT: SR XX Work Zone Speed Limit Reduction

Per Secretary's Executive Order E 1060.00, we are requesting that the posted regulatory speed limit within the above referenced location be reduced to XX MPH.

This temporary work zone speed limit change is being requested for the following reasons: (list applicable conditions and justification from the Work Zone Speed Limit Reduction Worksheet)

•

•

This posted speed reduction will be in effect from *Date to Date*, between *Milepost XX to Milepost XX*. The posted speed reductions will be in effect (*During Actual Work Hours* or *Continuously*). The dates and the locations may vary based on where the work activities that involve the safety issues listed above are present.

Approved:	
	Date
Regional Administrator	

cc: State Traffic Engineer
Area Maintenance Superintendent
WSP District Captain
Traffic file

Traffic file Contract file

Attachment: Supporting Documents

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3.doc

Speed Reduction Request Figure 5.B-3

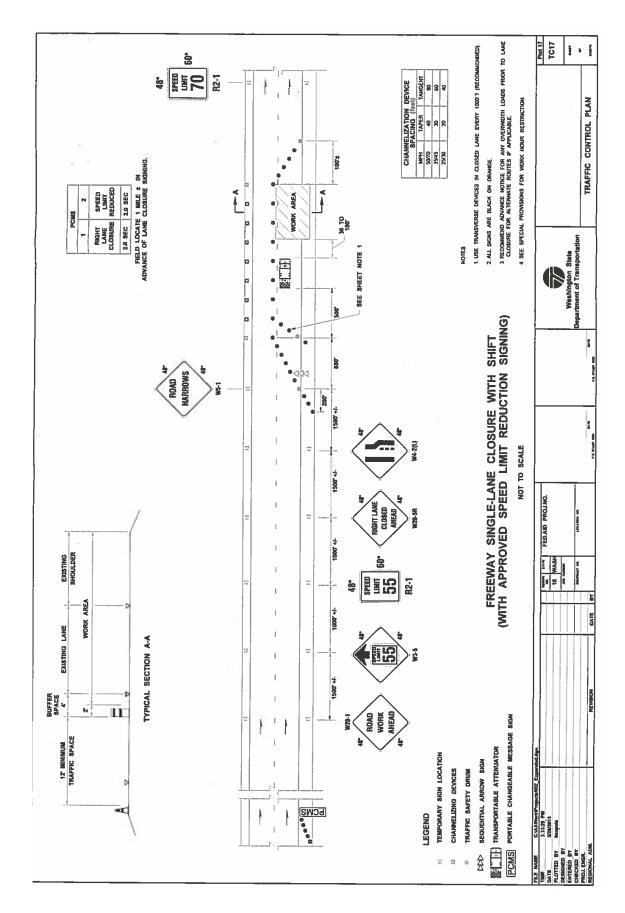


Figure 5.B-4a

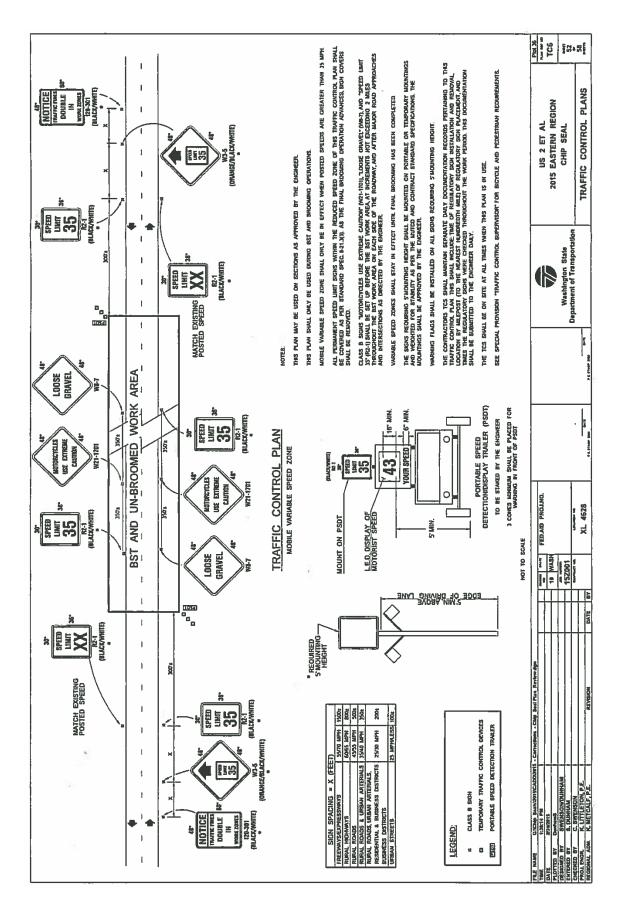


Figure 5.B-4b