

SDDOT CONSTRUCTION MANUAL  
PROJECT MANAGEMENT SECTION  
**CHAPTER 15 – WORK ZONE TRAFFIC CONTROL**

**MAXIMUM LANE CLOSURES ON INTERSTATE AND HIGH-SPEED MULTILANE HIGHWAYS**

The SDDOT *Work Zones for Interstate and High-Speed Multilane Highways* policy stipulates lane closures on Interstate and high-speed multilane highways will be no longer than five miles in length without prior approval from either the Construction and Maintenance Engineer or the Director of Operations. Requests for longer lane closures may be submitted via email and must include justification for the request. Exceptions will be determined on a case-by-case basis; however, they will not be granted if the sole reasoning is that the Contractor's operations will be faster or more efficient with less impact to the traveling public, as this is generally true for all lane closures.

Lane closures up to 10 miles in length may be allowed for one day or less for construction work with very high production rates (i.e., shoulder chip seals). More than one lane closure may be permitted; however, there will be a minimum three-mile section between lane closures, excluding the taper.

This policy applies to Interstate and multilane highways with posted speed limits greater than 45 mph. The five-mile lane closure maximum does not apply to head-to-head traffic on these facilities.

**WORK ZONE SPEED REDUCTIONS**

The following will be used as guidance when selecting projects to use additional measures for work zone speed control and for determining how to utilize those measures within the work zone. The intent of reducing driver speeds within the work zone is to promote safe and efficient traffic flow, as well as to enhance the ability of traffic to safely react to highway work zones and disruptions in traffic flow.

The use of any of the following measures does not eliminate the need for standard advance warning signs or other traffic control devices. First and foremost, the use of proper temporary traffic control is critical to warn drivers of work zone hazards. Some work zones may then need supplemental measures to further improve safety if crash or other data suggests such a safety hazard exists.

Establish realistic design speeds and work zone speed limits during the planning and design of the temporary traffic control plan. Reduced speeds should only be posted in the vicinity of work being performed or where necessitated by road conditions.

**Work Zone Speed Limit Reductions**

South Dakota Codified Law 32-25-19.1 states the Secretary of Transportation has the authority to establish limited speed zones through highway work areas on the state trunk highways. The SDDOT *Speed Zones through Highway Work Zones* policy provides the procedures for creating limited speed zones.

A DOT 299 must be filled out and sent to the Operations Traffic Engineer to request the appropriate speed limit reduction. The DOT 299 will include information on the work being done

on the project, the speed limit requested, and whether it will be in effect 24 hours a day, only while lane closures are present, or only while workers are present. The begin and end locations for the reduced speed limit as well as the approximate start and end dates for the reduced speed limit will also be included, along with justification for the reduction.

After reviewing the DOT 299, the Operations Traffic Engineer will send it to the Director of Operations, the Secretary of Transportation, the Secretary of Public Safety, and the Superintendent of the Highway Patrol via email for their approval. Signed copies of the DOT 299 are no longer obtained and will, therefore, not be sent to the requesting department staff. The Operations Traffic Engineer will keep an electronic copy of each DOT 299 and all email approvals on file.

While approvals are generally obtained rather quickly, it is recommended that the requests be sent in as soon as possible, but at least one week prior to the anticipated start date for the speed limit reduction. If approvals have not been obtained, the speed limit is not enforceable and cannot not be posted in the work zone. The Operations Traffic Engineer will notify the requestor when confirmation of approval has been received.

Signs will be installed according to the SDDOT *Speed Zones Through Highway Work Zones* policy, standard plate 634.63, or as shown in the plans. It is important that any signs for speed reductions intended to be in effect only during certain conditions be covered or removed when the condition does not exist. For example, if a 45-mph speed zone is only supposed to be in effect when workers are present, the SPEED LIMIT 45 signs need to be removed or covered when workers are not present.

### **DOT Cop Program**

The DOT Cop program allows the department to pay off duty Highway Patrol Officers to monitor and enforce our highway work zones. The Highway Patrol Officers sign up on a volunteer basis and use their patrol cars. They are required to be present in the work zone while working DOT Cop hours; enforcement is at their discretion. Their hours are submitted and their DOT Cop time sheets are signed by the Region Traffic Engineers.

While it is recognized that law enforcement can be effective at reducing speeding and undesirable driving behaviors in the work zone, keep in mind that law enforcement officers face many of the same types of hazards that highway workers face out on the roadway.

There are no criteria for which routes are eligible for the DOT Cop program but most Areas focus their efforts on the interstate. DOT Cops should be considered for:

- Complex or very short term changes in traffic patterns with significant potential for road user confusion or worker risk from traffic exposure.
- Existing traffic conditions and crash histories that indicate a potential for substantial safety and congestion impacts related to the work zone activity, and that may be mitigated by improved driver behavior and awareness of the work zone.
- High-speed roadways where unexpected or sudden traffic queueing is anticipated, especially if the queue forms a considerable distance in advance of the work zone or immediately adjacent to the work space.

- Night work operations that create substantial traffic safety risks for workers and road users.
- Work zones where radar speed feedback signs have been deployed but a reduction in vehicle speeds has not been achieved.

DOT Cops present an additional duty for enforcement agency manpower and equipment resources in a region. Therefore, if enforcement is to be used, it should be to address specific hazards.

Each year in the spring, the Area Engineers should meet with the District Highway Patrol to discuss the year's upcoming construction projects. Highway Patrol solicits volunteers from their staff. The Area's administrative staff then provides the officers with a seasonal application and a non-permanent payroll form (only fill out section A) which the officers complete and sign. These get sent to the Region Operations Engineer who signs them and they are forwarded to the Human Resource Specialist with the Bureau of Human Resources, where they are loaded into TKS. The Region Traffic Engineer signs off on their time forms each pay period.

There is a DOT Memorandum, *Contractor request for speed enforcement in work zones*, that provides direction to DOT project staff on the steps to take when a Contractor requests the presence of Highway Patrol for speed enforcement in work zones.

The number of DOT Cop hours for each Region is based on the Operations Support office's budget for the program. There are typically 250 hours per Region. If a Region does not think they will use all these hours, they should let the Operations Support office and the other Regions know in case they would be able to use them.

For work zones where traffic demands do not justify the use of enforcement or where enforcement needs exceed enforcement resources, other speed management technologies and supplements can be considered for implementation in the work zone.

### **Radar Speed Feedback Signs**

Radar Speed Feedback Signs (RSFS) display real-time vehicle speeds, alerting drivers to the speed they are traveling and reminding them of the posted or advisory speed limit.

RSFS should be used in work zones where there is a need for drivers to reduce their speed, as determined by the Region Traffic Engineer. Consider the use of RSFS in work zones where the following conditions exist:

- Interstate projects where work zone speed reductions to 45 mph are utilized or where there is closure of one or more travel lanes and workers are present in the adjacent lanes
- Where queueing, slowed traffic (beyond the posted or work zone speed limit), or rear end collisions are anticipated in an open lane (not signal or flagger controlled)
- Work zone crashes of concern are occurring
- Where an excessive number of vehicles exceed the posted speed limit
- Speed differential issues, which can be signified by queue formations
- When higher than normal traffic volumes are expected (such as during the Sturgis Motorcycle Rally)

- Night work operations
- Work area ingress and egress by construction vehicles requires the traveling public to reduce their speeds
- Horizontal curvature at median crossovers designed to a lower design speed than existing or prevailing speeds

The RSFS should be mounted above, below, or beside the regulatory speed limit sign. If the RSFS is used to supplement an advisory speed, it should be mounted beside the warning/advisory speed combination sign.

The following guidelines should be used for the placement of RSFS within a work zone:

- RSFS should be placed upstream (in advance of) the work zone activity area.
- The RSFS unit and any associated solar panels should be installed so as not to restrict lateral clearance or sight distances of other traffic control devices in the area.
- RSFS should be placed on the right-hand side of the highway and aligned to provide maximum legibility to approaching traffic.
- RSFS should be placed on the shoulder where sufficient space exists, or in the lane closed to traffic where shoulder widths are too narrow.

Within advisory speed zones or work zone speed limit zones, temporary RSFS are typically trailer-mounted, but vehicle mounted or other temporary sign mounting systems may be allowed. Truck- or trailer-mounted RSFS are not crashworthy. Therefore, these devices should be shielded where possible and removed when not needed or used. The devices must be delineated with a minimum of two drums.

The devices will read “YOUR SPEED” as a static message centered on the sign. Legend and background colors of this static sign will match the regulatory or advisory speed sign it is paired with. The changeable portion of the RSFS will have a black background with an amber illuminated legend.

The changeable message portion of the sign will display the speed of the approaching vehicle as two digits in MPH. The changeable message portion of the sign must not flash. The RSFS will be blank when no vehicles are present. Numeral height should be 18” for Interstate and at least 15” for other roadways.

RSFS installed in temporary speed zones should operate for the time period that the speed zone is in effect.

### **POSITIVE PROTECTION**

According to language contained in Final Rule 23 CFR 630 Subpart K, use of positive protection devices is based on an engineering study. An engineering study may be used to develop positive protection guidelines for the agency, or to determine the measures to be applied on an individual project to contain and/or redirect vehicles. Use of positive protection will be considered in work zone situations that place workers at increased risk from motorized traffic and where positive protection devices offer the highest potential for increased safety for workers and road users. Positive protection devices include, but are not limited to, the use of vehicle mounted attenuators and temporary barriers.

Temporary barriers are devices designed to prevent or reduce work zone penetration by vehicles while minimizing injuries to vehicle occupants. Temporary barriers are designed to provide positive separation of motorists from workers, bicyclists, and pedestrians.

Barrier itself is a hazard. Therefore, prior to including positive protection in a traffic control plan, careful consideration must be given to alternatives that would avoid or minimize exposure for workers and road users. Use of temporary barriers may also present challenges for contractor mobility or ingress/egress, and can create additional mobility challenges for the motorist in the areas where access points are created.

Strategies to avoid temporary barrier use should be considered. These strategies include:

- Removal of the hazard or fixed object from the clear zone
- Detouring traffic
- Minimizing exposure time
- Maximizing the separation between traffic and workers
- Scheduling or sequencing phases of work (e.g., sequence to install permanent guardrail first when planned as part of a project, accelerated construction techniques)
- Designing a full road closure or ramp closure with traffic detoured offsite
- Designing a road or lane closure with onsite diversion (e.g., median crossover, temporary pavement, use of full depth shoulders, using ramps as a diversion around a work zone at an interchange)
- Adding other options such as closing additional travel lanes to perform certain activities, performing work during non-peak travel periods, or using a slope wedge in lieu of open trenching

Guidelines for using positive protection in a work zone are based on the premise that positive protection will reduce the severity of potential crashes. Positive protection in work zones is considered warranted when:

- Consequences of striking a fixed object or running off the road are believed to be more serious than striking the positive protection.
- Probabilities of striking a worker or pedestrian are believed to be greater than striking the positive protection.

Projects that rarely require temporary barrier are listed below:

- Mobile, short duration, short term, and intermediate term work where typically the worker exposure for the installation and removal time for barrier offsets the safety benefits
- Projects that involve such maintenance work as asphalt overlays or surface treatment activities
- Work zones with short activity areas with insufficient length of need for barriers
- Work zones where use of barriers would reduce the acceleration/deceleration space required for the ingress and egress of construction vehicles

Conditions where the use of temporary barrier may be considered include:

- Unprotected features (walls, piers, sign structures, foundations, etc.)
- Interim unprotected features or objects (non-standard slopes, stockpiles, ditches within the clear zone, etc.)
- Pavement edge drop offs
- Non-traversable slope or steep/rough embankments
- Staged bridge construction
- Staged pipe or culvert construction
- Temporary pedestrian routes near high speed travel lanes
- Separation of opposing traffic, including multiple lane separations
- Where existing traffic barriers and bridge railings are removed during a construction phase

The protective requirements of a temporary traffic control situation should have priority in determining the need for temporary traffic barriers. The following factors should be considered before using temporary barriers:

- Speed/volume of traffic
- Vertical/horizontal roadway alignment
- Severity of hazard/excavation/obstacle
- Duration of exposure
- Duration of temporary traffic control zone
- Hazard presented by barrier itself once it is in place
- Hazard presented to workers and traffic during barrier placement
- Position of workers behind the barrier