

**South Dakota Department of  
Transportation**

# Traffic Operations Manual

Revised 02/26/2021

# **Forward**

This 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 department 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 this manual is a continuing process and revisions are issued periodically. Questions, observations, and recommendations are invited. Please send these to the South Dakota Department of Transportation (SDDOT) Operations Traffic Engineer at [Christina.Bennett@state.sd.us](mailto:Christina.Bennett@state.sd.us) or the address below.

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# Permanent Signing

## Permanent Signing Plans

See the Permanent Signing Manual for information on design and assembly of permanent signing plans.

## Interstate Traffic Generating Signs

Administrative Rule 70:04:01 (<http://legis.sd.gov/Rules/DisplayRule.aspx?Rule=70:04:01>) covers the definitions and criteria for installation of Interstate Traffic Generating Signs.

## Specifications for LED Border Signs

The following are specifications to be used to procure signs with LED borders:

Sign design will be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) and the Standard Highway Signs and Markings (SHSM) book. The signs requested are:

48" STOP (R1-1) sign, Quantity: 4 [Indicate the size, sign designation, legend, and quantity]

Sheet aluminum will meet the requirements of ASTM B209 for alloy 5052-H38 or alloy 6061-T6. The aluminum will be properly degreased and etched or treated with a light, tight, amorphous conversion coating conforming to ASTM B921 or ASTM B449. Sheet aluminum thickness will be 0.100 inches.

Sign sheeting will be in conformance with the requirements of ASTM D4956 Type XI.

LED lights will be embedded along the border of the sign. The LEDs will have a maximum diameter of ¼". The LEDs will be white or red If used with STOP or YIELD signs white If used with regulatory signs other than STOP or YIELD signs, or with guide signs white or yellow If used with warning signs or school area signs white, yellow, or orange If used with temporary traffic control signs. The LED lights will be wired in a manner that all LEDs continue to flash in the event of failure of an individual LED. The LEDs must be visible for at least 1,000 feet during daylight conditions.

LEDs will have dimming capabilities and automatically adjust flash brightness to varying light conditions. LEDs will be rated to operate at least 100,000 hours. Solar panels and batteries will be sized to allow continuous system operation. The system must operate for 12 days without sunlight. Batteries must be warranted for 5 years. No prorated of batteries replaced under warranty will be allowed. Batteries must be installed in a NEMA 3R cabinet with a Master Lock No. 2 Laminated Brass Padlock mounted on a pole underneath the solar panel.

The signs must be able to be mounted on 2.5-inch perforated square tube steel posts.

## Miscellaneous Signing Information

### Faded Signs Issue:

There was an issue with premature fading of signs from apparently 2006 to 2011, with mainly the black on white signs. An agreement was struck between the SDDOT and Lyle Signs to replace these signs; however, this was never done. The issue was brought back up at the March 2013 TEOP meeting, as hundreds of these signs are still out on our state highways. After several discussions with the TEOP, the Region Engineers, the Construction Engineer, the Construction and Maintenance Engineer, and the Director of Operations, it was determined that we will not seek compensation or replacement for the faded signs from the manufacturers. They will just need to be replaced as they would under maintenance work orders or sign replacement projects. The manufacturers had indicated that this was an issue that has been taken care of, so we should not see this on new installations going forward. If faded signs do show up on new projects, the type, number, location, and manufacturer of the signs needs to be recorded and submitted to the Operations Support Office, so we can address the issue.

## Permanent Signing Policies

The following is a list of SDDOT Policies related to permanent signing. These policies can be found on the intranet.

- Adopt-a-Highway
- Bridge Weight Limit Signing
- County Route Markers on State Highways
- Destination and Distance Signing on Non-Interstate Principal Arterial Highways
- Dignitary Signing on Right of Way
- Ditch Closures to Off-Road Vehicles
- Fatal Accident Markers
- Highway Numbering Policy
- Interstate Rest Area Service Signing
- Low Clearance Signing
- Memorial Highways and Auto Tour Routes
- Municipal Wayfinding Sign Program
- Off-Interstate Business Route Designation
- Policy and Procedure for State Designation of Scenic Byways
- Policy for Approving Special Welcome Signing within the Highway Right of Way
- Policy for Hospital Signing along Interstate and other State Highways
- Policy for Mileage Reference Markers
- Population Figures on Community Signs – Townboards
- Purple Heart Signing

- Road Delineation and Markers for Box Culvert, Pipe Culvert and Cattle Pass Ends on State Highways
- Sign Retroreflectivity Management
- Signing and Marking Road Breakups and Bumps
- Signing for Fallen Law Enforcement Officers
- Signing for Public Use Areas Administered by State and Federal Agencies
- Signing for Winter Recreation Areas
- Temporary No-Parking Zones on State Highways

# Pavement Markings

## Pavement Marking Materials

There are several types of pavement marking materials used by the SDDOT. Most pavement markings are a liquid material that is sprayed onto the pavement followed by an application of glass beads dropped onto the wet material. It is the glass beads that allow the pavement markings to be visible at night by directing the light from a vehicle's headlights back to the driver. This is known as retroreflectivity, and it is the value by which most pavement markings are measured. In order to increase retroreflectivity of pavement markings in wet conditions, bonded core reflective elements ("wet reflective" elements) may also be applied to the marking. The cost of the wet reflective elements is substantially higher than glass beads, therefore, they should only be applied in a groove where they will be more protected from wear from snow plow blades and vehicular traffic.

The material installed any a given route is at the discretion of the Region Traffic Engineer.

High build waterborne pavement marking paint is widely applied across the state. The material is a waterborne pavement marking paint with acrylic cross-linking polymers for added durability compared to standard waterborne pavement marking paints. When paint is installed on state highway routes, it should be high build waterborne pavement marking paint. This material may be surface-applied or grooved-in. Grooved-in high build waterborne pavement marking paint may have wet reflective elements applied.

Epoxy and polyurea are plural component liquid pavement markings that have greater durability than pavement marking paint. These materials are included on projects by use of the Special Provision for Durable Pavement Marking. These durable markings should be generally be grooved-in to take advantage of the extended life of these materials. Wet reflective elements may be applied to grooved-in durable markings.

Cold applied plastic pavement marking, also referred to as tape, is a preformed material with the yellow or white pavement marking with glass beads and wet reflective elements already adhered to them. They are attached to the roadway with adhesives and/or pressure. Tapes generally cost more per foot than liquid pavement marking materials, and therefore, should always be grooved in. Tapes have an expected life of 5 to 8+ years.

Preformed thermoplastic pavement marking is a preformed material similar to tape, but it is heat-applied to pavement surfaces. Properly applied preformed thermoplastic can have a bond that allows the marking to last longer under vehicular turning movements. Because of their cost, preformed thermoplastic markings should generally be grooved in.

## Pavement Marking Plans

Project plans may be assembled using either the Nonsection or Section method. In Nonsection plans, the pavement marking bid items will be included in the Estimate of Quantities (when there is one Estimate per PCN) or in the Grading Estimate of Quantities (when there is a separate Estimate of Quantities for Structures). In the Section method, all permanent pavement marking items, including bid items, notes, details, and standard plates, will be in Section M – Pavement Markings.

Tip: Plan note sheets are generally full of notes and not a lot of empty white space. If notes are needing to be added after plans are submitted to Bid Letting (for example, some notes are missing or some new notes were developed), and there is not room to add those notes, several sheets might end up getting revised just to make room for a couple of sentences. It never hurts to leave a little blank white space on some sheets to allow room to make changes to your plan notes.

All durable pavement markings installed on Interstate should include application of wet reflective elements. Wet reflective elements and high build waterborne pavement marking paint will be installed in all sinusoidal centerline rumble stripes. Wet reflective elements will not be installed on any surface applied pavement markings or on asphalt surface treatment projects.

It is recommended to not install grooved-in durable markings on microsurfacing projects. There have been issues with snow plows taking off some of the microsurfacing, and this is causing loss of the grooved-in markings.

## Pavement Marking Standard Notes

The standard notes for pavement markings can be found on the Downloadable files page of the SDDOT website under Plan Notes, [Section M – Pavement Marking Notes](https://dot.sd.gov/doing-business/engineering/design-services/downloadable-files) (<https://dot.sd.gov/doing-business/engineering/design-services/downloadable-files>).

The standard notes include time frames for application of permanent pavement markings that should be used on all projects. If a situation exists where it is anticipated that 14 calendar days will not be enough to complete installation of the permanent pavement markings as required, contact the Operations Traffic Engineer so there can be a discussion about the appropriate time frame. This way, we will be able to document the engineering judgment that went in to allowing a longer period of temporary pavement marking than is recommended in the Manual on Uniform Traffic Control Devices (MUTCD).

## Pavement Marking Standard Bid Items

High Build Waterborne Pavement Marking Paint, White & Yellow (633E1200 & 633E1205) per Gallon

These bid items should be used for most projects with this material. The per Gallon measurement and payment is for larger quantities of material.

High Build Waterborne Pavement Marking Paint, 4", 6", 8", 12", 24" White & Yellow per Foot; Area per Square Foot; and Arrow, Combination Arrow, Lane Reduction Arrow, Message, Symbol, and Railroad Crossing per Each bid items

The per Foot, Square Foot, and Each high build paint bid items should be reserved for projects with small quantities of this material, for urban locations with a lot of turn lanes and per foot measurements, or for projects with several structures that need a couple hundred feet or so of markings on each structure.

### No Passing Zone Markings

SDDOT standard practice is to use the minimum passing sight distance for 70 mph from Table 3B-1 of the MUTCD to mark no passing zones on rural highways with a posted speed limit of 65 mph. The minimum length of no passing zone marked is 500 feet. A no passing zone is marked 750 feet in advance of a stop-controlled intersection.

### Parking Space Markings

All parking space markings on state highways will utilize the color white, in compliance with the MUTCD. This includes crosshatch markings for access aisles. The SDDOT will not install the optional blue lines to supplement white parking space markings of each parking space designated for use only by persons with disabilities.

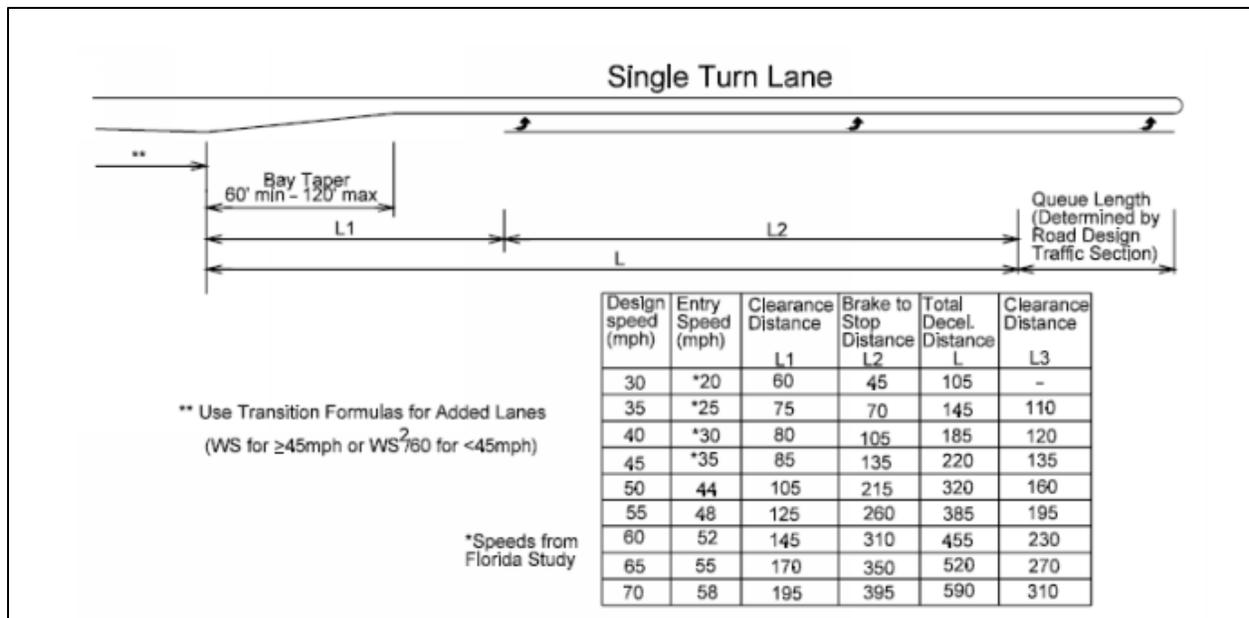
#### Parking Space Markings for Persons with Disabilities\*

The SDDOT standard for marking parking spaces for persons with disabilities will follow the International Symbol of Accessibility Parking Space Marking as shown in the MUTCD, using the minimum dimensions. The blue background and white border will be included with the International Symbol of Accessibility Parking Space Marking for such spaces on state highways.

\*Note: Refrain from referring to such parking spaces as "handicapped." They should be referred to as ADA parking spaces or parking spaces for persons with disabilities. Contact the Civil Rights Program Specialist with any questions regarding this designation.

### Left Turn Lane Markings

When marking left turn lanes, the figure below should be used. "Warranted" left turn lanes will have the gap in the solid white lane line marking, as depicted in the figure. The length of the gap will be calculated using the values in the table within the figure. "Unwarranted" left turn lanes will have a 25-foot gap after the bay taper, and the rest of the turn lane length marked with a solid white lane line marking. If the left turn lane is only 25-feet long, the entire length without a gap will be marked with a solid white lane line.



## Two-Way Left Turn Lane Markings

The MUTCD includes an Option statement: "Additional two-way left-turn lane-use arrow markings may be used at other locations along a two-way left-turn lane where engineering judgment determines that such additional markings are needed to emphasize the proper use of the lane. It is the SDDOT standard to install these additional two-way left-turn lane-use arrow markings; however, there may be situations in communities that have had center turn lanes for many years, so the spacing of additional arrows may be greater than typical spacing shown on the standard plates.

## Crosshatch Markings

Typical spacing of crosshatch markings installed on state highways will be 25' center-to-center. Typical placement is three crosshatch markings at 25' on center, followed by a gap of 75'.

# Temporary Traffic Control

## General

A Temporary Traffic Control Zone is an area of a highway where road user conditions are changed because of a work zone or incident using temporary traffic control devices, flaggers, uniformed law enforcement officers, or other authorized personnel.

Whenever the acronym “TTC” is used, it refers to “temporary traffic control.”

## Temporary Traffic Control Plans

Project plans may be assembled using either the Nonsection or Section method. In Nonsection plans, the temporary traffic control bid items will be included in the Estimate of Quantities (when there is one Estimate per PCN) or in the Grading Estimate of Quantities (when there is a separate Estimate of Quantities for Structures). In the Section method, all temporary traffic control items, including bid items, notes, details, and standard plates, will be in Section C – Traffic Control.

Tip: Plan note sheets are generally full of notes and not a lot of empty white space. If notes are needing to be added after plans are submitted to Bid Letting (for example, some notes are missing or some new notes were developed), and there is not room to add those notes, several sheets might end up getting revised just to make room for a couple of sentences. It never hurts to leave a little blank white space on some sheets to allow room to make changes to your plan notes.

Per Policy DOT-OS-OC-6.0 Work Zone Safety and Mobility Plan Policy, the goals, objectives, and guidelines in the Department’s [Work Zone Safety and Mobility Plan](#) will be considered for all projects.

A Table of Traffic Control Signs will be included in all TTC plans. A fixed location, breakaway sign layout and the applicable 634 series Standard Plates for the temporary traffic control operations will be included with the deliverables for the TTC plan. All plans that contain temporary pavement markings will include a breakdown of these quantities, preferably in a table format.

The standard table for Traffic Control Signs and Detour and Restriction Signing can be found on the Downloadable files page of the SDDOT website under Plan Notes, Section C – Traffic Control Notes, [Sign Tab Sheet](#) (<https://dot.sd.gov/doing-business/engineering/design-services/downloadable-files>).

The traffic control standard plates can be found under the Standard Plates Index on the SDDOT website in the drop down 634 Traffic Control (<https://dot.sd.gov/doing-business/engineering/design-services/standard-plates>).

The following items should be depicted on all fixed location, breakaway sign layouts:

- Label all important roadways joining or crossing the project, such as federal, state, and county highways and city streets.
- Show project stationing at the beginning and ending of the project and locations along the project where noting of stationing is essential such as at locations of interchanges, bridges, intersecting roads, terminal points of a major detour and haul road entrances.
- Include a North arrow.
- Show proposed sign number and descriptive legend at each location, using dimensioning or a table to show sign spacing. Location, erection, and spacing of signs will be in conformance with the current edition of the MUTCD and SDDOT guidelines.

Any project where the temporary traffic control will impact pedestrian facilities must adhere to the Department's Accommodating Pedestrians in the Work Zone document, found on the Downloadable Files page of the SDDOT website, under Plan Notes, listed below the Section C – Traffic Control Notes (<https://dot.sd.gov/doing-business/engineering/design-services/downloadable-files>). This document includes guidance for design and planning of the temporary pedestrian traffic control.

Temporary pavement marking quantities included in the plans need to be explained either through plan notes or a table. This allows field staff and Contractors to follow how the quantities were determined and to adjust quantities when changes are made to the sequence of operations. A plan note works well when the quantities are determined by multiplying the project length by the number of passes of temporary markings. There is a standard note depicting this. A table may be needed if there are several routes and/or more than one bid item for temporary pavement marking, to show where each type of temporary marking will be used and the quantity. A table may also be beneficial for urban reconstruction projects involving several phases and miscellaneous temporary markings such as arrows, crosswalks, and turn lanes.

## Temporary Traffic Control Standard Notes

The standard notes for temporary traffic control can be found on the Downloadable Files page of the SDDOT website, under Plan Notes, Traffic Control Notes (<https://dot.sd.gov/doing-business/engineering/design-services/downloadable-files>).

When listing a phone number for State Radio in the plans, ensure the correct State Radio site is referenced. A map of the State Radio Area of Responsibility can be obtained from the Operations Traffic Engineer or found at <U:\op\Operations Traffic\Work Zone Traffic Control\Standard Plans\StateRadioAreaOfResponsibility.pdf>

## Temporary Traffic Control Standard Bid Items

### Temporary Pavement Marking, Continuous 4" Edge Line (634E0620):

This bid item is no longer used. Payment for the temporary white edge line painted over the existing median side yellow edge line during two-way traffic operations (head-to-head on Interstate or four-lane divided facilities) is included in the per mile measurement for Temporary Pavement Marking, which also includes the double line of Temporary Raised Pavement Markers used to separate traffic in either direction.

A plan note should be used to clarify that this temporary marking is required and included in the temporary pavement marking per Mile bid item.

### Remove and Reset Traffic Control Movable Concrete Barrier (634E0705):

If the barriers need to be moved and reset on a project for a different traffic control phase, the moving of the barrier will be paid for each time it is needed to be removed and reset by utilizing this bid item. Small shifts in the placement of the barrier (not requiring loading of the barriers for movement) would not constitute the use of this item. For example, barrier used to close one lane of a two-lane bridge would not be paid for when shifting the barrier and tapers to close the other lane. Taking the barrier to the next structure on the project would.

### Remove and Reset Traffic Control Concrete Barrier End Protection (634E0755):

Where movable concrete barrier is switched from closing one lane to closing an adjacent lane, we do not pay to move the barrier itself, but we do pay to move the crash cushion under this bid item.

### Detour and Restriction Signing (634E1002)

Those signs being installed on the project for a detour route, an overwidth restriction, and/or an overwidth detour should be in a separate table for Detour and Restriction Signing, paid per SqFt under this bid item. This applies to special signs made for detour routes as well as standard route markers with DETOUR, cardinal direction, and arrow plaques.

Route restriction signs should be placed in a separate table for Detour and Restriction Signing, paid per SqFt under this bid item, even when no dedicated detour route is marked for these restrictions. There was a significant price difference in the Traffic Control Signs and Detour Signing bid items (Detour Signing was the former description for this bid item). Because of this, overwidth and overheight restriction signs that require a design in the plans will be included in the Detour and Restriction Signing item.

### Temporary Business Signing (634E1020)

In April 2018, the Construction Standards Panel recommended that smaller individual signs should typically be used for temporary business signing, although larger designs with multiple businesses shown with "Access To" at the top may be used where the signs would not be too large and become a maintenance issue in the wind. Examples of both

types of signs are shown below. The panel also recommended that all temporary business signing have a blue background instead of orange, because work zones become a sea of orange devices. Both the spacing and height of these signs need to be monitored in the field so that clutter and visibility does not become an issue for the traveling public.



## Temporary Rumble Strips

SDDOT Maintenance and Construction projects have recently incorporated the use of temporary rumble strips in the work zone. Temporary rumble strips are installed perpendicular to the direction of travel with the purpose of alerting the drivers to the work zone.

The following is intended to serve as guidance to staff on the use of the temporary rumble strips, as recommended by the Traffic Engineering Operational Panel (TEOP). If you would like to submit questions regarding temporary rumble strips to the TEOP, please contact Christina Bennett, Operations Traffic Engineer, at [Christina.Bennett@state.sd.us](mailto:Christina.Bennett@state.sd.us) or 605-773-4759. It is not the intent of the Department to require the use of temporary rumble strips in either maintenance or construction work zones at this time.

The primary purpose of temporary rumble strips is alerting drivers, not speed reduction; therefore, they may be used on any project where increased awareness of the work zone is desired. Examples include flagger operations and lane closures. Temporary rumble strips have been used successfully in South Dakota on Interstate segments posted at 80 mph. They may also be used in urban areas. The key is to ensure the roadway is clean before placement of the temporary rumble strips. If there is debris on the roadway, the strips will not stay in place under traffic.

There is only one brand of products currently approved for use as a temporary rumble strip, the RoadQuake 2 and RoadQuake 2F (the F is for folding) by PSS (formerly Plastic Safety Systems, Inc.). It is recommended by PSS that temporary rumble strips not be used on the following roads or surfaces:

- Surface with fresh seal coat
- Bleeding asphalt
- Soft pavement, like fresh asphalt

- Heavily rutted road
- Gravel or stone road

PSS also recommends they not be used on horizontal curves because the force and angle of the vehicle traveling in the curve could force strips to move to the outside of the curve.

Typical application of temporary rumble strips is to place two arrays of three strips across the driving lane in advance of the merging or one-lane, two-way taper. Each array should be placed some distance upstream of the last two advance warning signs before the taper. This distance and the distance between each strip depend on speed. Manufacturer's recommendations should be used regarding proper installation and maintenance of the devices in the work zone.

The RUMBLE STRIPS AHEAD sign should be used in advance of the temporary rumble strips in all work zones where they are utilized. This is recommended based on experience in other states to avoid drivers thinking the strips are a hazard on the roadway that they need to avoid. The sign should be 48" x 48" with black lettering on a fluorescent orange background.

Maintenance traffic plates have been created and added to Section 7 – Traffic in the Maintenance Manual located on the intranet. PSS is also willing to send a representative to South Dakota for any training needed on temporary rumble strips.

## Flaggers

The SDDOT would consider the use of Automated Flagger Assistance Devices (AFADs) in work zones for the safety of the flaggers. These devices are covered in Section 6E.04 of the MUTCD.

## Work Zone Speed Limits

Information regarding work zone speed limits can be found in [Chapter 15 – Work Zone Traffic Control](#) of the SDDOT Construction Manual and Policy DOT-OS-OT-12.0 Speed Zones through Highway Work Zones.

## DOT Cop Program

Information regarding use of law enforcement personnel in work zones can be found in [Chapter 15 – Work Zone Traffic Control](#) of the SDDOT Construction Manual. There is also a document put together by the Roadway Safety Consortium for [Guidelines on Use of Law Enforcement in Work Zones](#), available in the National Work Zone Safety Information Clearinghouse at [workzonesafety.org](http://workzonesafety.org).

## Maximum Lane Closures on Interstate and High-Speed Multilane Highways

Information regarding maximum lane closures on Interstate and high speed multilane highways can be found in [Chapter 15 – Work Zone Traffic Control](#) of the SDDOT Construction Manual and in Policy DOT-OS-8.2 Work Zones for Interstate and High-Speed Multilane Highways.

## TTC Policies

The following is a list of SDDOT Policies related to temporary traffic control. These policies can be found on the intranet.

- Highway Construction & Maintenance Restrictions Notifications & Signing
- Speed Zones through Highway Work Zones
- Work Zone Safety and Mobility Plan Policy
- Work Zones for Interstate and High-Speed Multilane Highways

# Traffic Signals & Roadway Lighting

## General

Information regarding the design and planning of traffic signals and roadway lighting can be found in the Road Design Manual, Chapter 15 – Traffic (<https://dot.sd.gov/doing-business/engineering/design-services/forms-manuals>). This manual contains mainly information on the operations side of traffic signals and roadway lighting for the state. Any decisions made by the Traffic Engineering Operational Panel (TEOP) regarding the design and planning of traffic signals and roadway lighting will be included in this manual, along with reference to all policies related to traffic signals and roadway lighting.

## Traffic Signal Inspection Checklist

The Traffic Signal Inspection Checklist is to be used at the on-site inspection upon completion of a traffic signal installation. The on-site inspection will be conducted by the Project Engineer or Region Traffic Engineer with the Contractor, City Traffic Engineer, and the Traffic Design Engineer present. The inspection will be held as soon as possible to ensure traffic signals are not operational with timing and other defects or issues that could present a hazard to vehicular or pedestrian traffic.

## Specifications for Solar Powered Flashing Beacons

The following are specifications that should be used when procuring solar powered flashing beacons:

The solar powered flashing beacon assembly must be designed to flash under ambient temperature conditions (-40° F to +160° F) 24 hours a day, 7 days a week. Solar panels and batteries will be sized for continuous operation of the system. Battery life must be warranted for 5-years. No proration of batteries replaced under warranty will be allowed. Batteries must be installed in a weatherproof enclosure so constructed or protected that exposure to the weather will not interfere with successful operation.

Each beacon will consist of one signal section of a standard traffic signal face with a flashing CIRCULAR YELLOW LED indication with a nominal diameter of 12 inches or more. The LED module will be in accordance with the requirements of the current performance specifications of the Institute of Transportation Engineers.

Beacon flash rates will be in accordance with the current edition of the Manual on Uniform Traffic Control Devices. Beacons will have dimming capability to automatically adjust brightness.

The solar powered flashing beacon assembly must be able to be mounted on 2.5-inch perforated square tube steel posts. The solar powered flashing beacon assembly will

consist of all solar panels, flashers, battery cabinet, batteries, conduit, housing, and mounting hardware required to make the system operational.

## Traffic Signal and Roadway Lighting Policies

The following is a list of SDDOT Policies related to traffic signals and roadway lighting. These policies can be found on the intranet.

- Lighting on State Highways
- Traffic Signals on State Highways

# Safety/Misc.

## Speed Limits

The following procedure must be followed for the establishment of speed zones as authorized in SDCL 32-25-7, whereby the Transportation Commission may establish, by rules promulgated pursuant to chapter 1-26, a maximum speed limit of less than that established by §§ 32-25-1.1 and 32-25-4 upon any highway or portion of highway under the jurisdiction of the Department of Transportation, and any portion of highway under the jurisdiction of a state or federal agency if requested by the agency.

Most engineering approaches to speed limit setting are based on the 85th-percentile speed, which is the speed at which 85% of free-flowing traffic is traveling at or below. The typical procedure is to set the speed limit at or near the 85th-percentile speed. Adjustments to either increase or decrease the speed limits may be made depending on infrastructure and traffic conditions.

Setting a speed limit based on the 85th-percentile speed was originally based on safety. Specifically, research at the time had shown that traveling at or around this speed yields the lowest crash risk for drivers. The 85th-percentile speed also reflects the collective judgment of the vast majority of drivers as to a reasonable speed for given traffic and roadway conditions. This is aligned with the general sentiment that laws should not make people acting reasonably into lawbreakers; setting speed limits lower than 85th-percentile speed does not encourage compliance with the posted speed limit. Use of the 85th-percentile speed to set speed limits has the advantage of providing residents, businesses, and pedestrians with a realistic expectation of actual vehicular speeds.

### **Procedures for Setting Speed Limits**

#### **I. Requests for Speed Limit Changes**

Requests for speed limit changes can come from the public, whether private citizens or local government agencies. The DOT can also decide to initiate the procedure to change a proposed speed limit.

1. SDDOT Employees should direct all speed limit requests to the appropriate Region Traffic Engineer.
2. The Region Traffic Engineer will analyze requests for speed limits to determine if a speed study is necessary.
  - a. If the location has been analyzed in the past, and no changes to the location or conditions have occurred since, denial of the request can be relayed to the requesting agency or individual.
  - b. If the location has not been analyzed before, determine if conditions at the location or justification made by the requesting agency or individual warrant further investigation of the request.

3. The Region Traffic Engineer will review the road's environment, features, and condition and traffic characteristics.
  - a. The following features may be included in the review:
    - The existing speed limit
    - The character of the surrounding land environment (rural, suburban, urban)
    - The functional classification of the road
    - The roadside development information (number of accesses, types of businesses, etc.)
    - The roadway characteristics (lane width and number of lanes, medians, parking, etc.)
    - Vehicle, bicycle, and pedestrian activity
    - The presence of other items such as roadway lighting, sidewalks, bicycle lanes, etc.)
  - b. Adjustments for roadway factors may reduce the recommended speed by as much as 10 mph below the 85th-percentile speed based on engineering judgment that includes consideration of the following factors:
    - Narrow roadway pavement widths of less than 20 feet total.
    - Horizontal and vertical curves with limited sight distance.
    - High driveway density and/or driveways with restricted visibility.
    - Rural residential or developed areas with a higher potential for pedestrian and bicycle traffic.
4. Region Traffic staff will perform a speed study to observe and measure vehicle speeds at one or more representative spots along the road in ideal weather and under free-flowing conditions.
  - a. The procedure includes the use of radar speed detecting equipment to record the speed of at least 100 vehicles passing a designated point along the highway segment.
  - b. More than one point may be used to observe and collect vehicle speeds at the discretion of the Region Traffic Engineer.
5. The Region Traffic Engineer or designee will perform an analysis of vehicle speeds to determine 85th-percentile speed and other characteristics.
  - a. The MUTCD recommends that the posted speed limit be within 5 mph of the 85th-percentile speed.
6. The Region Traffic Engineer will review the road's crash history as provided by the Highway Safety Engineer.
  - a. Adjustments made for crash data may be lower than the 85th-percentile speed, but normally no more than 7 mph lower.
  - b. If the crash rate for a two-year period is much higher than the average for other roadways of similar classifications, adjustments may be considered.
  - c. Adjustments may be made based on crash data when enforcement agencies will assure a degree of enforcement that will make the speed zone effective.
7. The Region Traffic Engineer will review any unusual conditions not readily apparent.

8. The Region Traffic Engineer will make a recommendation of the appropriate speed limit for the segment of roadway investigated.
9. The Region Traffic Engineer will notify the requesting agency or individual of approval or denial of the requested speed limit.

## **II. Approved Speed Limit Request**

If the department has recommended approval of a speed limit request, the next step in the process is to submit a speed limit administrative rule proposal to the Transportation Commission. These proposals are agenda items at regularly scheduled meetings of the Transportation Commission and not phone conference meetings.

The Legislative Interim Rules Review Committee has requested that speed limit administrative rules not be served to them during the legislative session held January through March. Therefore, the DOT will avoid having a Public Hearing on such rules in December, January, or February. Per the procedure for public notice, service, and hearing required for adoption, amendment, or repeal of rules set forth in SCDL 1-26-4, the notice needs to be served at least twenty days before the public hearing. Because of the Thanksgiving holiday, the November Transportation Commission meeting is typically moved up and thus there is not the required twenty days available between the October Transportation Commission meeting and the November Transportation Commission meeting. Therefore, a Public Hearing is also typically not held in November.

The requesting agency or individual should be notified of the reason for the delay if an approved speed limit request falls within the aforementioned time periods.

1. The Region Traffic Engineer or designee will out a DOT-290 Permanent Speed Reduction letter and send it to the Operations Traffic Engineer. This letter must include:
  - a. The proposed new or revised speed limit administrative rule(s).
  - b. The estimated cost to make the necessary signing changes if approved.
  - c. An explanation of the proposed speed limits and the justification for the recommendation.
  - d. Concurrence from city officials, local law enforcement, and the SD Highway Patrol.
  - e. A map of the existing and proposed speed limits.
2. The Operations Traffic Engineer will verify concurrence with the recommendation to approve the request for speed limit changes. The Operations Traffic Engineer will discuss as needed with the Region Traffic Engineer.
3. The Operations Traffic Engineer will check the DOT-290 Permanent Speed Reduction letter for accuracy and information.
4. The Operations Traffic Engineer will send the DOT-290 to the DOT Chief Legal Counsel to submit for the next Transportation Commission meeting agenda.
  - a. All items for Transportation Commission meeting agendas need to be submitted at least one week prior to the scheduled meeting. The DOT Legal

Office will require time to go over the request and to draft and file the required legal documents prior to submitting for the agenda.

5. The Chief Legal Counsel will draft the proposed speed limit administrative rule changes.
6. The Chief Legal Counsel will submit the proposed speed limit administrative rule changes and the DOT-290 as a Legal item to request a Public Hearing for the proposed speed limit at the next Transportation Commission meeting.
7. At the Transportation Commission meeting, the Chief Legal Counsel will request a Public Hearing for the proposed speed limit administrative rule changes for the next Transportation Commission meeting.
8. Prior to the Public Hearing, the Operations Traffic Engineer will discuss the proposed speed limit administrative rule(s) with the DOT Chief Legal Counsel.
9. At least three days prior to the deadline for agenda items, which is one week prior to the scheduled Public Hearing, the Operations Traffic Engineer should contact the DOT Chief Legal Counsel to ensure the Public Hearing is submitted as a Legal item for the Transportation Commission agenda, along with the necessary attachments that include the proposed speed limit administrative rule change and the DOT-290.
10. The Operations Traffic Engineer will be present at the Public Hearing in case questions are asked by the Commissioners that the Chief Legal Counsel would need answered by a technical expert.
11. The Chief Legal Counsel will present the proposed speed limit administrative rule changes to the Transportation Commission for Public Hearing, discussion, and approval.
12. If approved by the Transportation Commission, the Chief Legal Counsel will serve the minutes of the hearing, a complete record of written comments, the fiscal note, and a corrected copy of the rule(s) on the members of the Interim Rules Review Committee.
13. The Chief Legal Counsel will appear before the Interim Rules Review Committee meeting to present the rules. If requested, the Operations Traffic Engineer will attend the Rules Review Committee meeting with the Chief Legal Counsel to provide technical expertise as needed.
14. If approved by the Rules Review Committee, the speed limit administrative rule changes will be filed and become effective, typically within a couple weeks. The Chief Legal Counsel will notify the Operations Traffic Engineer and the Region Traffic Engineer of the date when the new rules will take effect.

### **III. Denied Speed Limit Request**

If a requesting agency or individual wishes to pursue a request for speed limit changes that has been denied by the Department, the requesting agency or individual will be informed of the procedure for pursuing the request.

1. The Region Traffic Engineer will notify the Operations Traffic Engineer of the requesting agency or individual's desire to pursue the denied request, including contact information for the requesting agency or individual.

2. The Operations Traffic Engineer will verify concurrence with the recommendation to deny the request for speed limit changes. The Operations Traffic Engineer will discuss as needed with the Region Traffic Engineer.
3. If the requestor still wishes to pursue the speed limit administrative rule change, the Operations Traffic Engineer will contact the requesting agency or individual and inform them of the following procedure for a person outside a state agency to propose a change to an administrative rule, as set out in SDCL 1-26-13 Petition for rules:
  - a. As described in SDCL 1-26-13, a petition is needed that must contain the identification of the rule sought to be changed or repealed, the text or substance to an existing rule, and the reasons for the proposal.
  - b. Should the requesting agency or individual choose to file a petition, the Department has 30 days to either deny the petition in writing stating the reasons for the denial, or to initiate the rule-making process.
  - c. The petition is sent to the Secretary of Transportation at 700 E Broadway Ave, Pierre, SD 57501.
4. Once the petition is received by the DOT, the Operations Traffic Engineer will work with the Chief Legal Counsel to draft a response for the Secretary of Transportation to send to the requestor. The Secretary of Transportation has 30 days to respond to a petition. Typically, DOT will put the petition on the next Transportation Commission meeting agenda to request a public hearing. If the DOT denies the petition to go before the Transportation Commission, the Chief Legal Counsel must submit this information to the Interim Rules Review Committee.
5. If the petition is being put on the next Transportation Commission meeting agenda to request a public hearing, Steps II.5 through II.14 above will be followed.

### **Related Documents**

- SDCL 1-26-4. Notice, service, and hearing required for adoption, amendment, or repeal of rules
- SDCL 1-26-13. Petition for rules
- SDCL 32-25-7. Establishment of speed zones
- SDCL 32-25-7.1. Establishment of maximum speed limit on any divided four-lane highway in rural areas
- SDCL 32-25-10. Changing speed or extent of established zone.

## **Rumble Strips and Stripes**

A rumble strip does not have a pavement marking inside the rumble, a rumble stripe does.

A flush seal or fog seal will be applied any time we are grinding in edge line, centerline, or transverse rumble strips. Sand for the flush or fog seal will not be applied to the rumble strip.

Centerline and edge line rumble strip/stripes must receive cover aggregate as part of the asphalt surface treatment projects to avoid trapping too much water within the rumble strip/stripe during rain events.

Transverse rumble strips will only receive a fog seal as part of the asphalt surface treatment projects. Cover aggregate will not be applied to maintain the effectiveness of the transverse rumble strip.