Inquiry: What are others doing for signing and/or safety treatments for schools along rural highways? We have some schools (high schools mainly, but kids are licensed at 14 here, so a lot of novice drivers) along 65 mph facilities that request various school zone signing, speed reductions, or radar speed feedback signs. We do have some crashes occurring at these locations and are looking for what traffic control devices are used other than a speed reduction, to improve the warning of the school and the traffic entering and exiting the school.

ARIZONA  
AZ’s response in the two links below.


See pages 9-10 for attachment from the first link; could not get the link to work inside the word document.

DELAWARE  
Our maximum speed limit on freeways in DE is 65, and our maximum limit on non-freeways (where we would have school or any access points) is 55. I haven’t been following all of the responses carefully, but at least some others were noting they only do reduced speed limits when there are walkers present. We follow that guidance as well. We get pressure to “do something” at some of our school zones on “higher speed” roads (i.e., speed limit 45).

IDAHO  
Idaho doesn’t really have a set standard/policy for school zone speed limits other than the requirement of an engineering study to establish one. We look at this very much on a case by case basis and try to be consistent in our approach. This study by TTI (https://static.tti.tamu.edu/tti.tamu.edu/documents/0-5470-1.pdf) presents some good information that may be helpful.

ILLINOIS  
Illinois statutes set school speed zones at 20 mph regardless of normal posted speed and we only establish these speed zones for roads where children are walking/crossing to and from school. We install the necessary warning and regulatory signs associated with school zones and crossings, however additional devices such as flashing beacons or radar speed feedback signs are the responsibility of the school if requested.

Although not used often, there is also an option to establish a school entrance speed limit up to 15 mph below the normal posted speed if a 20 mph school speed zone is not justified. This option may be established for entrances to school property during normal school hours when school buses or other vehicles are using the entrance to deliver or pick up students and where the normal posted speed limit is 45 miles per hour or more.
These school entrance speed limits are only established based on crash history or if all the following conditions are met:

A. The students are transported to and from school by bus and/or private vehicles.
B. No provisions are made for students to walk to and from school.
C. Where vehicles waiting to turn into the entrance cause excessive queuing on the highway.
D. The entrance is not controlled by traffic signals.

The assembly below is used to establish a school entrance speed limit with times on the SCHOOL DAYS plaque adjusted to fit local schedules. A Reduced Speed Limit Ahead sign with the school entrance plaque would be installed in advance of the below assembly.

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**IOWA**

We have installed school speed limits at a few school locations in rural areas. Our practice has been to lower the speed limit by 10 mph for the school zone, so in the areas where we have 65 mph speed limits on the expressways, we have established 55 mph school speed limits.

At one location the DOT installed turn lanes for the school entrance in addition to the school speed limit.

**KANSAS**

Kansas had to address this issue back around 2005/2006. Within about a 6-9 month span, there were about 4-5 fatalities involving teenage drivers coming from or going to the access point to a high school near or along a high speed facility (50 mph or higher).

The DOT was allowed to develop a plan of action before the legislature was to consider getting involved.

We developed a school zone program which provided state money for devices in both urban and rural settings. Attached are our typical drawings for a high speed facility.

Within the first 4-5 years, we were implementing a number of rural school zones across the state; however, that has really slowed down over the years. DOT forces install and maintain the rural school zones. Ideally these have been installed along facilities where
there are high schools but that has not always been the case. The 45 mph speed is a set speed for the rural school zone.

See pages 11 & 12 for attachments

**KENTUCKY**

Over the years, school flashers have become the standard treatment at our school entrances regardless of location, amount of pedestrian activity, etc. Our policy recommends a school speed zone 10 MPH lower than the normal posted speed limit.

We only have a few conventional roads with a 65 MPH speed limit (raised from 55 MPH to 65 MPH in recent years). At the time the school zones were established on these roads, the school speed limit was 45 MPH (10 MPH less than the previously posted 55 MPH zones). When the normal posted speed limit was raised, Districts were reluctant to raise the school speed zone. As a result, I believe a majority of those zones are still posted 45 MPH. I am sure that compliance is an issue at these locations.

**LOUISIANA**

Here is the link to Louisiana’s school policy on page 100


**MAINE**

In Maine, all schools are eligible for our school zone speed limit, which is 15 mph regardless of posted speed. We work with schools to add school zone speed limit signs with flashing lights, these are paid for by the schools. We are about to embark on a project to fund school zone signs with radar speed feedback signs.

**MASSACHUSETTS**

We do not have very many “rural” highways in Massachusetts, but we certainly do have schools located along what we consider high speed roadways (50-55 MPH). Our regulations only allow for the establishment of a School Zone for school age children of grades up to 8th. For these cases, we have a well-documented procedure for what is allowed for School Zone signing and how things should be laid out. That can be found in our Massachusetts Amendments to the MUTCD and I cut out a few relevant sections below.

### 7E-2 WARRANTS FOR SCHOOL ZONES

The following **minimum warrants** are specified for the establishment of a School Zone.

- The school property abuts the public right of way within the limits of the proposed zone area.
- School Children have direct access to the street or roadway from the school property.
- The zone must contain a marked crosswalk.
- The school must involve one or more grades between Grade 1 and Grade 8, inclusive.

### 7E-4 SCHOOL ZONE SPEED LIMIT SIGN USE

The School Zone Speed Limit Sign may be used at all locations to establish legal school zone speed limits of 20 MPH where the school building or the grounds thereof abuts the street or highway. It shall not be used at any other location.
The School Zone shall not begin more than 300 feet in advance of a point where the projected nearer line of the School Building intersects the abutting highway. The sign should be placed within 50 feet of the limits of the school zone, facing traffic entering the zone. The sign may erected on the shoulder, or it may be erected overhead.

The School Zone Speed Limit Sign should be erected over the roadway where curves, roadside development and other physical conditions do not permit at least 500 feet of advance sight distance to a side-mounted sign. Over the road mounting is recommended for all divided highways and highways of four or more lanes.

7E-5 SCHOOL ZONE SIGNS ON STATE HIGHWAYS

It is the policy of the department to install standard warning signs at all approaches to potentially hazardous locations. In the case of a school abutting a State Highway, the Department will, by permit, authorize the establishment of School Zones at the request of the municipality wherein the highway lies. All costs for the establishment and maintenance of a school zone speed limit on State Highway shall be borne by the municipality. A permit for each School Zone will be issued to the municipality setting forth the applicable terms for the zone operation.

7E-8 SCHOOL ZONES WITHIN SPEED ZONES

Where a school is within the limits of an authorized speed zone, the beginning of the speed zone shall be not less than 850 feet in advance of the school grounds in rural areas; 500 feet, or one block, whichever is less, in urban areas. There shall be no speed limit sign, other than a School Zone Limit 20 between the advance School Warning sign and the School Zone. A speed limit sign, to mark an authorized speed zone, shall be placed just beyond the end limit of the school zone facing traffic which has passed the school property.

That being said, we do have some regional schools and high schools that are located along higher speed roadways where they would not qualify for the traditional School Zone signing with the warning beacons. In these cases, we have been asked for just about everything from the installation of traffic signals, flashing warning beacons, hybrid beacons or RRFBs, to the installation of the radar speed feedback signs. We have historically been very stingy in terms of what we will sign off on, but at a minimum, the equipment must be procured and installed by the requesting party by permit (municipal school system, regional school district or utility) and they will have to sign off on a municipal traffic control agreement that outlines the responsibilities for paying the power cost for the device and maintenance responsibilities. Essentially, we avoid having to participate in any of this outside of having the device installed on our roadway.

MICHIGAN

Our state law pretty much dictates what we can do. If all the kids get there by some type of motoring transportation (ie no walkers) the school does not qualify for school speed limit. We of course place the S1-1 and other devices that would relate to any traffic generator. We would do a speed study with the state police to determine if the speed limit should be modified from our rural 65 or 55 mph.
MISSISSIPPI  Our typical treatment is to install a School Speed Zone – provided the school meets our traffic control for school areas signing policy criteria (minimum of 100 students; have direct access to a State highway or be the primary traffic generator for the roadway that connects to the State highway). The School Speed Zone is, by policy, set 10 mph less than the posted speed limit unless an engineering study determines it should be set even lower. If applicable, we’ll use an S1-1.

If there’s a crash problem or operational concerns we’ll consider other options. In the past few years, at a couple of schools that connected to a 4-lane divided highway, we converted the median opening from full access to directional access (RCUT) through the use of plastic curbing & snap-back delineators.

MISSOURI  There are a variety of things we do for schools:
- Simple Advanced school signing
- Advanced school signing with flasher (time clock controlled)
- School crosswalks (we require a crossing guard for these)
- School speed limits (a 10 mph drop from posted)

The link below is to our policy guide on the subject of school signing

http://epg.modot.org/index.php/903.19_Signing_for_School_Areas

NEBRASKA  Here is a policy we worked up a few years ago. The rural school speed zone was influenced by Kansas DOT having these speed zone in Kansas. One rural school saw this and wanted the speed limit lowered by their school as well. To date, I believe this is the only application of this rural school speed zone we have. It was a 45 school speed zone along a 60 mph highway, since then the highway has been raised to 65 with a 45 mph school speed zone.

You can sure see how we copied [KDOT] to develop ours, almost identical.

See pages 13-23 for attachment

NEW HAMPSHIRE  We generally try to reserve school zone speed limits for locations where there are pedestrians walking to/from school. There would not be many, if any, of those at rural locations with high speed highways. We consider those to be driveways and would likely only use school zone warning signs (S1-1), not much else. Fortunately, we don’t have 65 mph secondary roads, so it isn’t that much of an issue. The attached Google Earth image is probably the most we have done (and probably wouldn’t do again).

See page 24 for attachment

NORTH DAKOTA  N.D. used dynamic speed display signs (radar feedback signs) in some cases. The department doesn’t buy them. The municipalities are on the hook for installation and maintenance. We have a policy:

RHODE ISLAND  
Like New Hampshire, reduced school zone speed limits in Pennsylvania are reserved where children walk to school....so our approach is similar to theirs, use warning signs and flashers.

TEXAS  
Reduced school speed limits are used for school zones during the hours when children are going to and from school. School speed limits are considered for schools with pedestrian crossing activity or irregular traffic and pedestrian movements when children are being dropped off/picked up from school.

School speed limits coincide with the posted speed limits and are within 15 mph of each other in order to minimize abrupt changes in speed (with the exception of 55 mph which can be reduced by 20 mph to a 35 mph school speed limit). Factual studies, reason, and sound engineering judgment, rather than emotion, governs the final decision on the maximum deviation from the posted speed which provides a reasonable and prudent speed limit.

Based on the Texas Administrative Code Section 25.23, the Texas Department of Transportation established a maximum school speed limit policy of 35 mph. Lower school speed limits are considered when the posted speed is below 50 mph. Any roadway with a posted speed limit greater than 55 mph requires a buffer zone to transition down to a 35 mph school speed limit. According to Chapter 3, Section 3 of the Procedures for Establishing Speed Zones manual which TxDOT follows, it states “Where TxDOT is responsible for signing school speed zones and school transition speed zones, the SCHOOL SPEED LIMIT XX WHEN FLASHING sign should be used.” See image below for a typical school zone with flashing buffer zone.

SCHOOL SPEED LIMIT RESEARCH - The Texas A&M Transportation Institute conducted a research project, 0-5470-1 SPEEDS IN SCHOOL ZONES. Many of their findings were incorporated into the Procedures for Establishing Speed Zones manual.  
http://onlinemanuals.txdot.gov/txdotmanuals/szn/index.htm

A couple of findings that may be of interest to you:
- The speeds observed when the school zone is active are statistically lower when compared to the speeds observed when the school zone is not active; similarly, the
Mean speed in a buffer zone is significantly lower when the beacon is on than when the beacon is off.

- Speeds increase as the relative distance within the school zone increases. The practical application is that speeds increase approximately 0.9 mph for every 500 ft in school zone length. In other words, for every quarter-mile (1320 ft) of school zone length, speeds can be expected to increase almost 2.5 mph. Thus, longer school zones do not result in lower speeds for a longer distance.

**UTAH**


We wrote this into UDOT's MUTCD.

**VIRGINIA**

The following link takes you to VDOT school zone policy: [VDOT School Zone Policy](https://www.vdot.virginia.gov/schoolゾーンpolicy). In general, Virginia statutes designate school zone speed limits at 25 mph. In rural areas where speed limits are higher, school zone speeds can be higher if pedestrian travel is not an issue. School Zone Engineering study template and standard drawing is included in the policy link. Also, here is a link to VDOT's Safe Routes to School Program: [VDOT Safe Routes to School](https://www.vdot.virginia.gov/safe-routes-to-school) for your information.

**WASHINGTON**

Generally on Washington State Highways, the School Speed Limit of 20 MPH is reserved for locations where school children are walking to and from school and have to cross the state highway.

However, we do have one exception in a semi-rural area. WSDOT allowed a school speed limit of 35 MPH within a 45 MPH speed zone. The school sets back from the state highway and the road entrance to the school is within a horizontal curve with less than ideal sight distance. The school speed limit is when flashing with a preset flash schedule for both AM & PM peak times. This allows school buses and other vehicles to egress and ingress more safely from the school entrance road.

**WYOMING**

1. **School Advanced Crossing Assembly**

   The School Advance Crossing assembly shall consist of a school sign supplemented with an ahead plaque to warn road users that they are approaching an area of school activity.

   A School Advanced Crossing assembly should be placed in advance of the following:
   a) An un-fenced school playground which is next to the roadway.
   b) A designated school bus or parent drop-off or pick-up location which is next to the roadway or on the roadway shoulder adjacent to the school facility.

   A School Advanced Crossing assembly or reduced speed limits should not be used where school activities are not next to the roadway.

2. **School Crossing Assembly**

   The School Crossing assembly shall consist of a School Sign supplemented with a diagonal downward pointing arrow plaque to show the location of the crossing.
A School Crossing assembly shall be used at all Designated School Crossing.

3. Designated School Crossing

A designated School Crossing consists of the following devices:
   a) School Advance Crossing Assembly
   b) School Crossing Assembly
   c) Marked Crosswalk
   d) Advance School - Xing pavement word markings
   e) Curb parking restriction markings and signs
   f) Yield lines (Optional)

A Designated School Crossing should be considered:

   A) When the frequency of adequate gaps in the traffic stream during the time period
      students are using the crossing is less than the number of minutes in the same time
      period and there at least 10 students using the crossing during the highest crossing
      hour.
   B) At all uncontrolled designated school walking routes crossing on the State Highway
      System.

A Designated School Crossing should not be installed on high speed roads (45 mph or
higher). In that case, students should be bused or taken to school across the road by
parents, or school boundaries revised to eliminate the need for the crosswalk.

*In one particular instance we used the School Advanced Crossing Assembly
supplemented with a flashing beacon.*
311 SPEED LIMIT SIGNING

Speed Limit (R2-1) sign sizes shall at a minimum conform to the dimensions in the table of regulatory sign sizes in the MUTCD for this sign type. However, signs installed at the beginning of each reduced speed zone shall be at least 36” by 48” for conventional roadways and 48” by 60” for divided roadways and freeways.

Speed Limit signs shall be located at the points of change from one speed limit to another and near the entrances to the State on numbered routes. See TGP 333 for signing at state boundaries. Additional signs may be installed beyond traffic interchanges, beyond significant junctions with other State highways, and at other locations where it may be appropriate to advise motorists of the prevailing speed limit.

Engineering judgment should be exercised when selecting locations in the field for speed limit signing. When topographical or geometric constraints are encountered at the recommended location, the sign should be located as close as practical to the recommended location. Sign location tolerances at speed zone breaks should not exceed 500 feet in rural areas and 250 feet in urban areas. Where a speed limit sign that marks the beginning of a speed zone cannot be installed within the tolerance, the Regional Traffic Engineer (for non-freeways) or the Interstate Sign Crew Supervisor (for freeways) notifies the State Traffic Engineer so that the speed regulation can be amended to more-closely reflect the actual location of the speed signs. See TGP 223 for details on the process for modifying speed regulations.

In rural areas where the posted speed limit is less than 55 mph, the recommended maximum spacing for speed limit signs in miles should be \( \frac{V}{6} \), where \( V \) is the posted speed limit in miles per hour. In rural areas where the posted speed limit is 55 mph or greater, the recommended maximum spacing for speed limit signs should be \( \frac{V}{5} \).

In urban areas, since traffic conditions vary widely, engineering judgment should be used to determine the maximum spacing of speed limit signing.

The Speed Reduced Ahead (W3-5aAZ) sign shall be installed in advance of each reduced speed zone requiring a reduction in speed of 15 mph or more on non-freeways and in advance of all speed reductions on freeways. The Speed Reduced Ahead sign, if used, should be installed 500 feet to 1000 feet in advance of each speed zone. Shorter distances may be used in or near urban areas where lower speeds prevail. In some instances, based on engineering judgment, it may be appropriate to install a Speed Reduced Ahead sign in advance of a speed zone requiring a 5 or 10 mph reduction, such as on the approach to a community from a rural area.
The size of the Speed Reduced Ahead sign shall be at least 36” by 36” for conventional roadways and 48” by 48” for divided roadways and freeways. On divided roadways and freeways, the Speed Reduced Ahead signs (if used) and initial set of speed limit signs at the beginning of a reduced speed zone should be placed on both the left and right sides of the roadway.
TYPICAL SCHOOL ZONE
RURAL SCHOOLS ADJACENT TO THE HIGHWAY
SCHOOL ENTRANCE LESS THAN 1/2 MILE
TO THE HIGHWAY
POSTED 50 MPH OR HIGHER

- NO PASSING ZONE ESTABLISHED
- 8" EDGELINE ESTABLISHED (PROVIDED ROADWAY IS 24" MINIMUM)

NOTE 1: The reduced school speed limit will be 45 mph. The beacons on the reduced school speed limit assembly and S4-5 are to be in effect a maximum of 4 hours during a school day when students are arriving and leaving school and during agreed to special events.

1: Guide signs, D1-2, are installed for high schools only and the signs are located 300 ft. from the entrance radius point.

3: The S1-1, S4-3, S4-4, S4-5, and KS3-3 signs shall be FLUORESCENT YELLOW background with black legend and border when new signs are installed.

4: The KS4-1, R2-1, R2-2, and W16-2 signs shall be FLUORESCENT YELLOW background with black legend and border when new signs are installed.

5: All distance measurements are approximate and adjustments can be made in the field based on existing conditions.

6: A KS4-1 with stop sign at county road intersection and highway may be used if at least 500 vehicles utilize intersection during arrival or leaving school.

Approved by the State Transportation Engineer 3/23/06
(April 25, 2007)
**TYPICAL SCHOOL ZONE**

**RURAL SCHOOLS ADJACENT TO THE HIGHWAY**

**SCHOOL ENTRANCE CONNECTS WITH HIGHWAY POSTED 50 MPH OR HIGHER**

- **NO PASSING ZONE ESTABLISHED**
- **6" EDGELINE ESTABLISHED (PROVIDED ROADWAY IS 24' MINIMUM)**

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**NOTE 1:** The reduced school speed limit will be 45 mph. The beacons on the reduced school speed limit assembly and S4-5 are to be in effect a maximum of 4 hours during a school day when students are arriving and leaving school and during agreed to special events.

2. Guide signs KS3-2, are installed for high schools only and the signs are located 300 ft. from the entrance radius point.

3. The W16-2, KS3-2, S4-3, S4-4, and S4-5 signs shall be FLUORESCENT YELLOW background with black legend and border when new signs are installed.

4. The KS4-1 signs shall be FLUORESCENT YELLOW background with black legend and border when new signs are installed.

5. All distance measurements are approximate and adjustments can be made in the field based on existing conditions.

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**Approved by the State Transportation Engineer 3/23/06**

(April 25, 2007)
General Information:

The North Dakota Department of Transportation (NDDOT) has developed guidelines to allow municipalities to install and maintain Dynamic Speed Display Signs (DSDS) within the right-of-ways on the State Highway System. These guidelines are to be used by the District Engineers for requests to install permanent dynamic speed display signs in right-of-ways on state highways.

When requested, DSDS will be considered for use on the State Highway System where the speed limit is 40 MPH or less. In speed zones over 40 mph, the NDDOT will review the request on a case-by-case basis.

A. Purpose & Objective:

Dynamic speed display signs are installed to provide a real-time dynamic display of a driver’s vehicular speed at a particular location where speeding has been determined and documented to be a safety problem. When used in conjunction with a regulatory speed limit sign (R2-1), drivers receive immediate confirmation of their actual speed in comparison to the legal speed limit static signs. DSDS are allowed under, and guidance is provided for their use in, Part 2 of the MUTCD.

DSDS are typically used at locations where a speed limit transition occurs or in an area where driving the appropriate speed for the highway conditions is particularly critical, such as around school speed zones. Because law enforcement agencies cannot be expected to constantly monitor speeds in a particular location, the DSDS serve to supplement regular enforcement of speed limits alerting drivers to specific driving behavior.

B. Technical Requirements:

DSDS must meet the following specifications and documentation and supplied to NDDOT District as outlined in Section F:

1. Installation of any DSDS shall be a stand-alone structure located at a minimum of 100’ from the transition speed limit sign. A Speed Limit sign (standard or school speed zone) shall be installed above the DSDS.
2. The minimum height from the bottom of the signs to the edge of the driving lane shall be 5’ if no parking or pedestrian traffic is present. If pedestrian traffic or parking is present or if it is in a 4-lane section of roadway, the
minimum height shall be 7’. The sign should face oncoming traffic at an appropriate angle for the radar to be picked up by passing motorists (specified by the manufacturer).

3. Installation is restricted to one DSDS in each direction for the area being addressed.

4. The DSDS static sheeting shall include the legend “YOUR SPEED” centered on the sign. The legend and background shall match the regulatory sign it is paired with. The static sheeting for the speed limit (R2-1) shall be white with a black legend. For school speed limit assemblies (R2-1 with S4-3), the static sheeting shall be fluorescent yellow-green with black legend.

5. The changeable message display shall have a black background with an amber (yellow) illuminated legend.

6. The changeable display shall be programmed to read “XX” or have no display when the vehicle speed exceeds 15 MPH over the posted speed.

7. When activated, the DSDS shall give drivers immediate feedback on their individual driving speed when the posted speed is exceeded. The flash rate shall be between 50 & 60 cycles per minute.

8. The installation shall not interfere with the visibility and general effectiveness of any other signs in the area. A minimum distance of 300’ of clear sight distance should be maintained. Consideration should be given to existing road geometry, topography and roadside vegetation.

9. When installed in association with school speed zones, the DSDS shall operate only when the school speed zone is in effect. (Generally, the DSDS will operate only on days that schools are in session, for thirty minutes before and thirty minutes after the time in which the school day begins; and thirty minutes before and thirty minutes after the time in which the school day ends). Use of DSDS in conjunction with school speed zones “when children are present” is not allowed.

10. Information shall be supplied to the District that documents that the DSDS and sign support assembly and installation meet the requirements for crashworthiness as defined in the National Cooperative Highway Research Program (NCHRP) Report 350. DSDS shall be mounted to a breakaway support that meets NDDOT specifications.
11. The DSDS shall be constructed of materials that withstand extreme temperatures and are vandalism resistant. Lenses shall be shatter proof plexiglass with water tight seals and a locked access to the interior electronics.
12. All elements of the DSDS shall conform to the guidance and standards as outlined in the latest edition of the MUTCD adopted by the NDDOT.
13. Identification and contact information for the municipality in which it is installed shall be displayed on the case of the DSDS.

C. **Eligible Requesting Entities:**

All requests for DSDS on the North Dakota State Highway System shall be submitted by the governing body of a municipality *unless* the DSDS is a specific permit condition on a private developer. Where the DSDS has been made a permit condition to a developer, the municipality shall be the co-applicant on the permit application.

D. **Municipal Responsibility:**

Municipalities shall be responsible for all costs of the installation, maintenance, and removal of the DSDS located within the state’s highway right-of-way (ROW).

Municipalities shall be responsible for ongoing electric costs and all maintenance of the DSDS, including annual maintenance and replacement if damaged. The municipalities are responsible to contact OneCall and submit a copy of the diagram or plan including connections to power poles and their location to them.

E. **Permits and Maintenance Agreement:**

Access permits for work performed by non-NDDOT personnel in the ROW, must be obtained with a Utility Occupancy Application and Permit for the installation of permanent post mounted DSDS.

Information can be found on the NDDOT website under NDDOT, click on Business, Signing and Utilities then Utility Occupancy Application and Permit Information or access the site by clicking on the link: www.dot.nd.gov/divisions/design/utilitypermits.htm

F. **Application Process:**

Requests from the governing bodies of municipalities shall include the following information:
1. Cover letter addressed to the NDDOT District requesting permission for installation of the DSDS.
2. Submission of a Utilities Occupancy Application and Permit.
3. A scaled drawing that shows the existing regulatory speed signs and their legends; the location and legend of other nearby signs, and adjacent features (sidewalks, driveways, existing street lighting, traffic signals, adjacent land uses). The sketch or plan must either be at a specific scale or include measured distances between pertinent features.
4. A diagram or plan indicating how the DSDS will be powered (solar or hard-wired, including connections to power poles and their location).
5. Documentation that the technical requirements outlined in Section B have been met.

H. **Ongoing Maintenance and Evaluation of Permanent Signs:**

The requesting entity shall have the DSDS calibrated once a year at a minimum and submit the results to the District. Calibration obtained by comparing the output reading with a Highway Patrol radar gun is acceptable.

I. **Removal of Permanent Signs:**

The NDDOT reserves the right to remove any non-compliant DSDS if they are determined not in conformance with the statutory requirements and conditions set forth in the Utility Occupancy Application Permit at the expense of the municipality.

If the governing body of a municipality no longer desires the DSDS, or the NDDOT District Engineer determines that the DSDS are no longer warranted, the municipality is responsible for all costs associated with the removal or restoration of the State Highway ROW to the satisfaction of the NDDOT.

J. **Approval Process:**

The NDDOT District Office will issue the governing body of the municipality a permit after determining that the proposed DSDS meets the Technical Requirements outlined in Section B, above. Assurance of financial and maintenance responsibility of the municipality is a requirement of the permit and every other year permit renewal.

The NDDOT District Engineer will review, approve and process the permit and submit a copy along with the supporting documentation to the NDDOT Programming Division. The District will then input the DSDS location(s) in the RIMS database inventory as a utility component under the facility code 98 that has been created for Dynamic Speed Display Signs. The Utility Company will be entered as “City of ___________________”.
This document is subject to revision.

Attachments:

1- SFN 7995, Utility Occupancy Application and Permit
2- Installation of a Dynamic Speed Display Sign (DSDS) for Municipalities
3- Dynamic Speed Display Sign Details
4- Breakaway Coupler System for Perforated Tubes, use with Standard Drawings:
   D754-23, Assembly Details (Perforated Tube)
   D754-24, Mounting Details, Perforated Table (Slip Base)
   D754-25, Mounting Details Perforated Tube (Posts)
5- Breakaway Coupler System for Standard Pipe, Stub Post, use with Standard Drawings:
   D754-1, Pipe Assembly Details
   D754-2, Breakaway Base and Foundation Details
   D754-4, Multi-Directional Breakaway Base
   D754-5, Foundation Data for Steel Supports
   D754-7, Mounting, Post Cap, and Panel Details
   D754-8, Attachment Brackets for Standard Steel Pipe
Installation of a Dynamic Speed Display
Sign (DSDS) For Municipalities

Technical Requirements:
DSDS must meet the following specifications and documentation to that effect must be supplied to NDDOT District as outlined in the Application Process below:

1. Installation of any DSDS shall be a stand-alone structure located at a minimum of 100’ from the transition speed limit sign. A Speed Limit sign (standard or school speed zone) shall be installed above the DSDS.
2. The minimum height from the bottom of the signs to the edge of the driving lane shall be 5’ if no parking or pedestrian traffic is present. If pedestrian traffic or parking is present or if it is in a 4-lane section of roadway, the minimum height shall be 7’. The sign should face oncoming traffic at an appropriate angle for the radar to be picked up by passing motorists (specified by the manufacturer).
3. Installation is restricted to one DSDS in each direction for the area being addressed.
4. The DSDS static sheeting shall include the legend “YOUR SPEED” centered on the sign. The legend and background shall match the regulatory sign it is paired with. The static sheeting for the speed limit (R2-1) shall be white with a black legend. For school speed limit assemblies (R2-1 with S4-3), the static sheeting shall be fluorescent yellow-green with black legend.
5. The changeable message display shall have a black background with an amber (yellow) illuminated legend.
6. The changeable display shall be programmed to read “XX” or have no display when the vehicle speed exceeds 15 MPH over the posted speed.
7. When activated, the DSDS shall give drivers immediate feedback on their individual driving speed when the posted speed is exceeded. The flash rate shall be between 50 & 60 cycles per minute.
8. The installation shall not interfere with the visibility and general effectiveness of any other signs in the area. A minimum distance of 300’ of clear sight distance should be
maintained. Consideration should be given to existing road geometry, topography and roadside vegetation.

9. When installed in association with school speed zones, the DSDS shall operate only when the school speed zone is in effect. (Generally, the DSDS will operate only on days that schools are in session, for thirty minutes before and thirty minutes after the time in which the school day begins; and thirty minutes before and thirty minutes after the time in which the school day ends). Use of DSDS in conjunction with school speed zones “when children are present” is not allowed.

10. Information shall be supplied to the District that documents that the DSDS and sign support assembly and installation meet the requirements for crash-worthiness as defined in the National Cooperative Highway Research Program (NCHRP) Report 350. DSDS shall be mounted to a breakaway support that meets NDDOT specifications.

11. The DSDS shall be constructed of materials that withstand extreme temperatures and are vandalism resistant. Lenses shall be shatter proof plexi-glass with water tight seals and a locked access to the interior electronics.

12. All elements of the DSDS shall conform to the guidance and standards as outlined in the latest edition of the MUTCD adopted by the NDDOT.

13. Identification and contact information for the municipality in which it is installed shall be displayed on the case of the DSDS.

**Municipal Responsibility:**

Municipalities shall be responsible for all costs of the installation, maintenance, and removal of the DSDS located within the state’s highway right-of-way (ROW).

Municipalities shall be responsible for ongoing electric costs and all maintenance of the DSDS, including annual maintenance and replacement if damaged. The municipalities are responsible to contact OneCall and submit a copy of the diagram or plan including connections to power poles and their location to them.

**Permits and Maintenance Agreement:**

Access permits for work performed by non-NDDOT personnel in the ROW, must be obtained with a Utility Occupancy Application and Permit for the installation of permanent post mounted DSDS.

Information can be found on the NDDOT website under NDDOT, click on Business, Signing and Utilities, then Utility Occupancy Application and Permit Information or access the site by clicking on the link below:

http://www.dot.nd.gov/divisions/design/utilitypermits.htm
Application Process:

Requests from the governing bodies of municipalities shall include the following information:

1. Cover letter addressed to the NDDOT District requesting permission for installation of the DSDS.
2. Submission of a Utilities Occupancy Application and Permit.
3. A scaled drawing that shows the existing regulatory speed signs and their legends; the location and legend of other nearby signs, and adjacent features (sidewalks, driveways, existing street lighting, traffic signals, adjacent land uses). The sketch or plan must either be at a specific scale or include measured distances between pertinent features.
4. A diagram or plan indicating how the DSDS will be powered (solar or hard-wired, including connections to power poles and their location).
5. Documentation that the technical requirements outlined in Section C have been met.

Maintenance and Evaluation of Permanent Signs:

The requesting agency shall have the DSDS calibrated once a year at a minimum and submit the results to the District. Calibration obtained by comparing the output reading with a Highway Patrol radar gun is acceptable.

Removal of Permanent Signs:

The NDDOT reserves the right to remove any non-compliant DSDS if they are determined not in conformance with the statutory requirements and conditions set forth in the Utility Occupancy Application Permit at the expense of the municipality.

If the governing body of a municipality no longer desires the DSDS, or the NDDOT District Engineer determines that the DSDS are no longer warranted, the municipality is responsible for all costs associated with the removal or restoration of the State Highway ROW to the satisfaction of the NDDOT.
### Dynamic Speed Display Sign Details

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<thead>
<tr>
<th>Component</th>
<th>Conventional Road</th>
<th>Expressway</th>
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<tbody>
<tr>
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<td>48&quot; - 55&quot;</td>
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<td>C</td>
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<td>D</td>
<td>12&quot; - 15&quot;</td>
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- (a) Series D or E font

#### Perforated Tube Support

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- (b) See Standard Drawing D754-24 and Break-Away Coupler System for Perforated Tubes Detail Sheet

#### Pipe Support

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- (c) See Standard Drawing D754-02 and Break-Away Coupler System for Standard Pipe Detail Sheet
**BREAK-AWAY COUPLER SYSTEM**

**FOR PERFORATED TUBES**

**NOTES:**
1. 4" Vertical clearance of anchor or breakaway base. The 4” x 60” measurement shall be made from the top of the anchor unit and shall be the same as specified on the post.
2. Anchor unit shall be the same size as the post and shall have the same requirements as specified by DENT BREAKAWAY COUPLER SYSTEM manufactured from material meeting the requirements of ASTM A325 and shall be ordered in accordance with AASHTO M232.
3. When used in concrete sidewalks, anchors shall be the same as specified for anchor unit above and below post location and also back and ahead of post.
4. Fasteners with the special requirements as specified by DENT BREAKAWAY COUPLER SYSTEM may be used. The breakaway coupler system shall be manufactured from material meeting the requirements of ASTM A325.
5. Anchors shall be ordered from SHERIDAN IND., INC. which meets the test requirements of NCHRP Report 350.
6. In lieu of the breakaway base system on standard D-754-24, the breakaway coupler system may be used. The breakaway coupler system shall be fabricated from steel meeting the requirements of AASHTO M-183 and M232.

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**BASE PLATE WITH BREAKAWAY COUPLER**

---

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<th>Number of Post</th>
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**Telescoping Perforated Tube**

- 8" x 10" gauge post: The 8" x 10" gauge post is shown as 2.5" size on the plans.
- The 2" x 10" gauge post is shown as 2.19" size on the plans.
- The 2" x 10" gauge post is shown as 2.19" size on the plans.

---

**Diagram:**

- **Break-Away Coupler System for Perforated Tube Detail**
- **Diagram of Break-Away Coupler System**

---

**Figure:**

- **Figure showing Break-Away Coupler System**
- **Diagram of Break-Away Coupler System**

---

**Notes:**

- 8" x 10" gauge post: The 8" x 10" gauge post is shown as 2.5" size on the plans.
- The 2" x 10" gauge post is shown as 2.19" size on the plans.
- The 2" x 10" gauge post is shown as 2.19" size on the plans.
BASE DATA TABLE

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<th>DIMENSION</th>
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<th>D</th>
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NOTES:

1. Assemble posts to stub with breakaway coupling bolts and one flat washer as shown.
2. Shim as required to remove void.
3. Tighten all bolts to the maximum possible with 12" to 15" wrench.
4. In lieu of the breakaway base system on standards D-754-3 and D-754-4, the breakaway coupling system may be used. The breakaway coupling system shall be manufactured from material meeting the requirements of ASTM A325.

Assembly Procedure:

1. Assemble posts to stub with breakaway coupling bolts and one flat washer as shown.
2. Shim as required to plumb post.
3. Tighten all bolts to the maximum possible with 12" to 15" wrench.
4. In lieu of the breakaway base system on standards D-754-3 and D-754-4, the breakaway coupling system may be used. The breakaway coupling system shall be manufactured from material meeting the requirements of ASTM A325.

SHIM DETAIL

Provide 1/8" E for galvanized drainage

PLAN BASE PLATE

Provide 1/8" E for galvanized drainage

Break-Away Coupler System for Standard Pipe Detail