

## ***NDDOT Requirements for the Use of Vehicle Speed Feedback Signs on the State Highway System***

### General Information:

The North Dakota Department of Transportation (NDDOT) has developed requirements for the installation and maintenance of Vehicle Speed Feedback Signs (VSFS), previously Dynamic Speed Display Signs (DSDS), installed within the right-of-way on the State Highway System. This document also covers VSFS installed by a local agency or municipality through the NDDOT request and approval process.

### A. Purpose & Objective:

VSFS provide drivers with real-time dynamic display of a driver's vehicular speed at a particular location where speeding is 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. VSFS are allowed under, and guidance is provided for their use in Part 2 of the MUTCD.

VSFS 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 and entering a rural community. Because law enforcement agencies cannot be expected to constantly monitor speeds in a particular location, the VSFS serve to supplement regular enforcement of speed limits alerting drivers to specific driving behavior.

### B. Technical Requirements:

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

1. VSFS shall be used at key locations, such as speed zone transitions or school zones and installed below the speed limit sign (standard or school speed zone).
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 VSFS in each direction for the area being addressed.
4. The VSFS static sheeting shall include the legend “YOUR SPEED” centered on the sign. The legend YOUR SPEED shall be a black legend on a fluorescent yellow background. For school speed limit assemblies (R2-1 with S4-3), the static sheeting shall be fluorescent yellow-green with black legend.
5. The VSFS static sheeting should be approximately the same width of the speed limit sign it is mounted below. Sign retroreflectivity shall meet day and night minimum standards.



6. The changeable portion of the VSFS legend should be the same height, width, and stroke of those on the Speed Limit sign it supplements or is mounted below.
7. The changeable legend displaying the speed of the approaching vehicle shall be a yellow luminous legend on a black opaque background. The digital readout shall be programmed to read “XX”. When no vehicles are approaching, the changeable display shall not display a legend.
8. When activated, the VSFS shall give drivers immediate feedback on their individual driving speed when the posted speed is exceeded. The dynamic display shall blank out when speeds exceed 30mph over the posted speed limit.
9. The VSFS shall not flash, strobe, or use other dynamic elements. Where existing VSFS include this feature, they shall be disabled. The Owners/User’s Manual provides directions on disabling this feature.
10. 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.
11. When installed in association with school speed zones, the VSFS shall operate only when the school speed zone is in effect. Generally, the VSFS 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 VSFS in conjunction with school speed zones “when children are present” is not allowed.
  12. VSFS shall be mounted to a breakaway support that meets NDDOT specifications.
  13. The VSFS 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.
  14. All elements of the VSFS shall conform to the guidance and standards as outlined in the latest edition of the MUTCD adopted by the NDDOT.
  15. Identification and contact information for the municipality in which it is installed shall be displayed on the case of the VSFS.

C. Submittals:

The governing body of a municipality shall submit all requests for VSFS on the North Dakota State Highway System *unless* the VSFS is a specific permit condition on a private developer. Where the VSFS is a permit condition to a developer, the requesting agency shall be the co-applicant on the permit application. The permit application can be found on the NDDOT website.

<https://www.dot.nd.gov/forms/sfn62129.pdf>

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 VSFS.
2. 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.
3. A diagram or plan indicating how the VSFS will be powered (solar or hard-wired, including connections to power poles and their location).
4. Documentation that the technical requirements outlined in Section B are met.

D. Approval Process:

The NDDOT District Engineer will review, approve, and process the request upon receipt of the required permit and submittals.

E. Cost Participation, Operation, and Maintenance Responsibilities:

The requesting municipality shall be responsible for all costs of the installation, operation, and maintenance of the VSFS located in the state's highway right-of-way as defined in the citywide maintenance agreement.

The requesting municipality shall be responsible for ongoing electric costs and all maintenance of the VSFS, including annual maintenance and replacement if damaged. The requesting municipality is responsible to contact OneCall and submit a copy of the diagram or plan including connection to power poles, if applicable, and their location to them.

The requesting entity shall calibrate the VSFS once a year at a minimum. Calibration obtained by comparing the output reading with a Highway Patrol radar gun is acceptable.

Where a VSFS is recommended by the NDDOT on the State Highway System as part of a study or NDDOT safety project, the NDDOT will be responsible for installation costs, operations, and maintenance of the VSFS. Where a VSFS is removed and reset on a NDDOT project, the NDDOT will re-install.

## Attachments

1. Vehicle Speed Feedback Sign Support Summary
2. Vehicle Speed Feedback Sign Support Summary with Solar Panel
3. Vehicle Speed Feedback Sign Assembly Details

## References:

Standard Drawings: <https://www.dot.nd.gov/dotnet2/view/std Drawings.aspx>

Breakaway Coupler System for Perforated Tubes, use with standard drawings:

D754-23 Perforated Tube Assembly Details

D754-24 Mounting Details Perforated Tube

D-754-24A Breakaway Coupler System for Perforated Tubes

D754-25 Mounting Details Perforated Tube

Breakaway Base and Foundation Details, use with standard drawings:

D754-01 Pipe or W-Shape Assembly Details

D754-02 Breakaway Coupler System for Standard Pipe – Stub Post

D754-03 Breakaway System for Standard Pipe – Stub Post

D754-04 Multi-Directional Breakaway System for Standard Pipe – Stub Post

D754-05 Foundation Data for Steel Supports

D754-06 Hinge Plate, Fuse Plate, and Foundation Details for Standard Pipe

D754-07 Pipe Support and Sign Mounting Details

																	STATE	PROJECT NO.	SECTION NO.	SHEET NO.			
																	N.D.	VSFS	110	1			
Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs		Sign Support Length				Vert Clearance	Support Size	Max Post Len	Sleeve Length				Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
			IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF	FT		LF	LF	LF	LF									
Expressway					18.5	18.7	19.0		7.0	2.25 x 2.25 12 ga	19.7	5.6	5.8	6.1	2 x 2 12 ga	3	4	3 x 3 7 ga				3	
Conventional					17.4	17.7			7.0	2.5 x 2.5 12 ga	18.7	5.5	5.8		2.25 x 2.25 12 ga	2	4	3 x 3 7 ga				2	
School - Conv					18.0	18.2	18.4		7.0	2.5 x 2.5 10 ga	21.7					3	4	3 x 3 7 ga				3	
School - Expy					19.5	19.7	20.0		7.0	2.5 x 2.5 12 ga	22.7	4.8	5.1	5.3	2.25 x 2.25 12 ga	3	4	3 x 3 7 ga				3	
<b>Sub Total</b>			0.0	0.0			<b>Total</b>	205.1							<b>Total</b>	44.0			0	0	11		
<b>Grand Total</b>			0.0	0.0			<b>Total</b>	205.1							<b>Total</b>	44	0		0	0	11		

This document is preliminary and not for construction or implementation purposes.

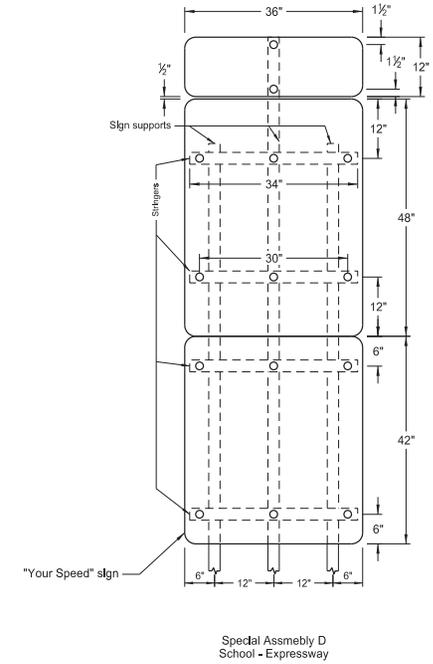
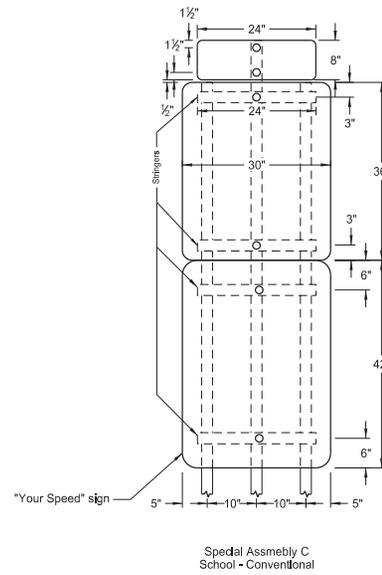
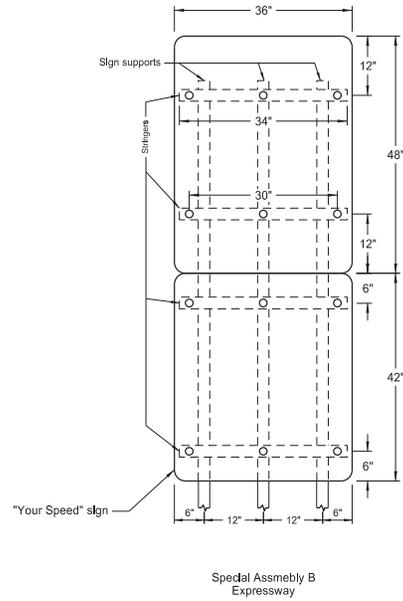
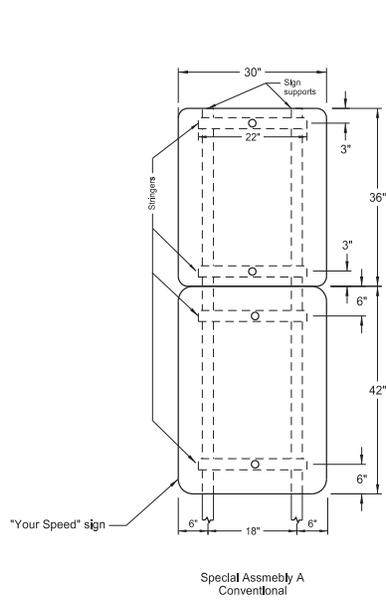
Sign Summary  
Perforated Tube  
VSFS

																STATE	PROJECT NO.			SECTION NO.	SHEET NO.		
																N.D.	VSFS			110	1		
Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs		Sign Support Length				Vert Clearance	Support Size	Max Post Len	Sleeve Length				Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
			IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF	FT		1st LF	2nd LF	3rd LF	4th LF									
<b>Standard</b>																							
Expressway					18.5	18.7	19.0		7.0	2.25 x 2.25 12 ga	19.7	5.6	5.8	6.1		2 x 2 12 ga	3	4	3 x 3 7 ga			3	
Conventional					17.4	17.7			7.0	2.5 x 2.5 12 ga	18.7	5.5	5.8			2.25 x 2.25 12 ga	2	4	3 x 3 7 ga			2	
<b>Sub Total</b>			0.0	0.0	<b>Total</b>		91.3										<b>Total</b>	20.0		0	0	5	
<b>School</b>																							
Conventional					18.0	18.2	18.4		7.0	2.5 x 2.5 10 ga	21.7						3	4	3 x 3 7 ga			3	
<b>Sub Total</b>			0.0	0.0	<b>Total</b>		54.6										<b>Total</b>	12.0		0	0	3	
<b>Solar</b>																							
Expy - School					19.6	19.9	20.1		7.0	2.5 x 2.5 12 ga	22.4	5.1	5.3	5.6		2.25 x 2.25 12 ga	3	4	3 x 3 7 ga			3	
Expressway					18.6	18.9	19.1		7.0	2.5 x 2.5 12 ga	20.2	5.6	5.8	6.1		2.25 x 2.25 12 ga	3	4	3 x 3 7 ga			3	
Conventional					17.4	17.7			7.0	2.5 x 2.5 12 ga	18.7	5.5	5.8			2.25 x 2.25 12 ga	2	4	3 x 3 7 ga			2	
Conv-School					18.2	18.4	18.6		7.0	2.5 x 2.5 10 ga	21.4						3	4	3 x 3 7 ga			3	
<b>Sub Total</b>			0.0	0.0	<b>Total</b>		206.5										<b>Total</b>	44.0		0	0	11	
<b>Grand Total</b>			<b>0.0</b>	<b>0.0</b>	<b>Total</b>		<b>352.4</b>										<b>Total</b>	<b>76</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	

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Sign Summary  
Perforated Tube  
VSFS  
with solar panel

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	VSFS	110	



Note  
Stingers for "Your Speed" sign may vary based on manufacturers mounting specifications.

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Special Assemblies  
Vehicle Speed Feedback Sign