III-09.01 Introduction

The preparation of plans for streets and highways depends upon the type of roadway. Sign sizes depend on the roadway classification. There are many variables that should be considered when preparing the plans. The roadway type will determine the legend size, which will then determine the sign sizes. The various conditions will determine what signs are to be used. The MUTCD will provide the guidance necessary to determine what signs are needed for the site conditions. The Standard Highway Signs Booklet and the North Dakota Department of Transportation Standard Signs Supplement will provide the required sign sizes of the signs for the various classified roadways. Vertical and horizontal clearances will vary depending on the type of signs and the roadway classification.

III-09.01.01 Different Types of Construction

The type of construction determines how signing plans are prepared. The types are Preventive Maintenance, Minor Rehabilitation, Structural Improvement, Major Rehabilitation, and New or Reconstruction.

Preventive Maintenance (PM): Signs will not be required to be upgraded as part of these projects unless identified by the Statewide Safety Program. Signage not in compliance with the MUTCD will be updated if engineering judgment indicates that:

- One compliant device in the midst of a series of adjacent non-compliant devices could potentially be confusing to the road user.

- The anticipated schedule for replacement of the whole series of non-compliant devices will result in achieving timely compliance with the MUTCD.

All railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

Minor Rehabilitation (MiR): Signs will not be required to be upgraded as part of these projects unless identified by the Statewide Safety Program. Signage not in compliance with the MUTCD will be updated if engineering judgment indicates that:

- One compliant device in the midst of a series of adjacent non-compliant devices could potentially be confusing to the road user.

- The anticipated schedule for replacement of the whole series of non-compliant devices will result in achieving timely compliance with the MUTCD.

All railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

Structural Improvement (SI): All regulatory and warning signs and pavement markings will be verified to comply with current MUTCD standards or brought up to MUTCD standards if necessary, and all railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

Major Rehabilitation (MaR): All regulatory and warning signs and pavement markings will be verified to comply with current MUTCD standards or brought up to MUTCD standards if necessary, and all railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

New or Reconstruction: All regulatory and warning signs and pavement markings will be verified to comply with current MUTCD standards or brought up to MUTCD standards if necessary, and all railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

III-09.02 Different Types of Roadways

Tables III-09.01 – III-09.07 show standards for signing for different types of roadways.

III-09.02.01 Undivided Roadways

There are several types of roadways that determine the letter sizes, sign sizes, and vertical clearances. An undivided roadway can have various numbers of lanes: two-lane, three-lane, four-lane, and five-lane.

For a two-lane roadway that has one lane in each direction, the legend size will be used as shown in the Standard Highway Signs Booklet and the Supplement.

For a three-lane roadway that has one lane in each direction and a two-way left turn lane in the middle, the legend size will be used as shown in the Standard Highway Signs Booklet and the Supplement.
For a four-lane roadway that has two lanes in each direction, the legend size will be used as shown in the Standard Highway Signs Booklet and the Supplement.

For a five-lane roadway that has two lanes in each direction and a two-way left turn lane in the middle, the legend size will be used as shown in the Standard Highway Signs Booklet and the Supplement.

The sizes can be increased if an engineering study has determined that a larger size is needed.

The vertical clearances are as shown on Standard Drawings D-754-1 and D-754-23. These standard drawings can be found on the web at:
http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm under Standard Drawings.

III-09.02.02 Divided Highways

III-09.02.02.01 Expressways with Partial Control of Access

Expressways have two types of access in North Dakota. Access is obtained using either interchanges or at-grade intersections.

Interchanges should be signed as shown in the MUTCD, Chapter 2F. The letter size for guide sign requirements are shown in Section III-09.08.01 and should be used for the signs stated. The regulator and warning sign legend size should be as shown in the Standard Highway Signs Booklet for Expressways.

At-grade intersections should have Stop control, One Way signs, and Divided Highway signs installed at the intersection. Routes should be signed as shown for Conventional Roads, Chapter 2D in the MUTCD. Where stop or signal controls are used, the route turn assembly should be placed across the roadway.

The median width will govern whether yield and one-way signs are to be placed. See Figures 1 thru 4A in Appendix III-09 A.

III-09.02.02.02 Freeways

Freeways are to be signed as shown in the MUTCD, Chapter 2F. Letter size for guide sign requirements are shown in Section III-09.08.02 and should be used for the signs stated. The regulator and warning sign legend size should be as shown in the Standard Highway Signs Booklet for Freeways.

See Appendix III–09 B and Appendix III–09 C for Interchange Numbering, Names and Classification for I–94 & I–29 respectively.
The overall dimensions of the regulatory and warning signs shall be as shown in Table III-09.01, III-09.02, and III-09.03 or as shown in the MUTCD in Table 2B-1: Regulatory Sign Sizes, 2C-2: Warning Sign Sizes, and 2C-3: Minimum Size of Supplemental Warning Plaques.

Table III-09.01: Regulatory Sign Sizes (Table 2B-1 in the MUTCD)

Sign	MUTCD Code	Section	Conventional Road (in)	Expressway (in)	Freeway (in)	Minimum (in)	Oversized (in)
Stop	R1-1	SB.04	30 x 30	36 x 36	-	24 x 24	48 x 48
Yield	R1-2	2B.08	36 x 36 x 36	48 x 48 x 48	60 x 60 x 60	30 x 30 x 30	-
To Oncoming Traffic	R1-2a	-	24 x 12	-	-	-	-
4-Way	R1-3	2B.04	12 x 6	-	-	-	-
All Way	R1-4	2B.04	18 x 6	-	-	-	-
Yield Here to Peds	R1-5	2B11	18 x 18	-	-	-	-
Yield Here to Pedestrians	R1-5a	2B.11	18 x 24	-	-	-	-
In-Street Ped Crossing	R1-6,6a	2B1.12	12 x 36	-	-	-	-
Speed Limit	R2-1	2B.13	24 x 30	36 x 48	48 x 60	-	-
Truck Speed Limit	R-2-2	2B.14	24 x 24	36 x 36	48 x 48	-	-
Night Speed Limit	R2-3	2B.15	24 x 24	36 x 36	48 x 48	-	-
Minimum Speed Limit	R2-4	2B.16	24 x 30	36 x 48	48 x 60	-	-
Combined Speed Limit	R2-4a	2B.16	24 x 48	36 x 72	48 x 96	-	-
Fines Higher	R2-6	2B.17	24 x 24	36 x 36	48 x 48	-	-
Turn Prohibition	R3-1,2,3,4,18	2B.19	24 x 24	36 x 36	-	-	48 x 48
Mandatory Movement Lane Control	R3-5 Series	2B.21	30 x 36	-	-	-	-
Optional Movement Lane Control	R3-6	2B.22	30 x 36	-	-	-	-
Mandatory Movement Lane Control	R3-7	2B.21	30 x 30	-	-	-	-
Advance Intersection Lane Control	R3-8,8a,8b	2B.23	(variable x 30)	-	-	-	-
Two-Way Left Turn Only (overhead mounted)	R3-9a	2B.24	30 x 36	-	-	-	-
Two-Way Left Turn Only (ground mounted)	R3-9b	2B.24	24 x 36	-	-	-	36 x 48
Reversible Lane Control (symbol)	R3-9d	2B.25	108 x 48	-	-	-	-
Reversible Lane Control (ground mounted)	R3-9f	2B.25	30 x 42	-	-	-	-
Advance Reversible Lane Control Transition Signing	R3-9g,9h	2B.25	108 x 36	-	-	-	-
End Reverse Lane	R3-9i	2B.25	108 x 48	-	-	-	-
Preferential Only Lane Ahead (ground mounted)	R3-10 series	2B.26	30 x 42	36 x 60	78 x 96	-	-
Preferential Only Lane Operation (ground mounted)	R3-11 series	2B.26	30 x 42	-	78 x 96	-	-
Preferential Only Lane Ends (ground mounted)	R3-12 series	2B.26	36 x 42	36 x 60	48 x 84 48 x 96	-	-
Preferential Only Lane Ahead (overhead mounted)	R-13 series	2B.26	66 x 36	84 x 48	144 x 78 144 x96	-	-
Preferential Only Lane Operation (Overhead mounted)	R-14 series	2B.26	72 x 60	96 x 72	144 x106 144 x 124 144 x 90	-	-

Sign	MUTCD Code	Section	Conventional Road (in)	Expressway (in)	Freeway (in)	Minimum (in)	Oversized (in)
HOV 2+ Lane Ends (Overhead Mounted)	R3-15 series	2B.26	66 x 36	84 x 48	102 x 60	-	-
Do Not Pass	R4-1	2B.29	24 x 30	36 x 48	48 x 60	18 x 24	-
Pass With Care	R4-2	2B.30	24 x 30	36 x 48	48 x 60	18 x 24	-
Slower Traffic Keep Right	R4-3	2B.31	24 x 30	36 x 48	48 x 60	-	-
Trucks Use Right Lane	R4-5	2B.32	24 x 30	36 x 48	48 x 60	-	-
Trucks Lane XX Feet	R4-6	2B.32	24 x 30	36 x 48	48 x 60	-	-
Keep Right	R4-7,7a,7b	2B.33	24 x 30	36 x 48	48 x 60	18 x 24	-
Keep Left	R4-8	2B.33	24 x 30	36 x 48	48 x 60	18 x 24	-
Do Not Enter	R5-1	2B.34	30 x 30	36 x 36	48 x 48	-	-
Wrong Way	R5-1a	2B.35	36x 24	36 x 24	42 x 30	-	-
No Trucks	R5-2,2a	2B.36	24 x 24	30 x 30	36 x 36	-	48 x 48
No Motor Vehicles	R5-3	2B.36	24 x 24	-	-	-	-
Commercial Vehicles Excluded	R5-4	2B.36	24 x 30	36 x 48	48 x 60	-	-
Vehicles with Lugs Prohibited	R5-5	2B.36	24 x 30	36 x 48	48 x 60	-	-
No Bicycles	R5-6	2B.36	24 x 24	30 x 30	36 x 36	-	48 x 48
Non-Motorized Traffic Prohibited	R5-7	2B.36	30 x 24	42 x 24	48 x 30	-	-
Motor-Driven Cycles Prohibited	R5-8	2B.36	30 x 24	42 x 24	48 x 30	-	-
Pedestrians, Bicycles Motor-Driven Cycles Prohibited	R5-10a	2B.36	30 x 36	-	-	-	-
Pedestrians and Bicycles Prohibited	R5-10b	2B.36	30 x 18	-	-	-	-
Pedestrians prohibited	R5-10c	2B.36	24 x 12	-	-	-	-
One Way	R6-1	2B.37	36 x 12	54 x 18	54 x 18	-	-
One Way	R6-2	2B.37	24 x 30	36 x 48	36 x 48	18 x 24	-
Divided Highway Crossing	R6-3, 3a	2B.38	30 x 24	36 x 30	-	24 x 18	-
No Parking	R7-1,2,2a,3,4,5,6, 7,8, 107,108	2B.39	12 x 18	-	-	-	-
Van Accessible	R7-8a,8b	2B.40	18 x 9	-	-	12 x 6	-
No Parking, Bike Lane	R7-9,9a	9B.09	12 x 18	-	-	-	-
No Parking (with transit logo)	R7-107a	2B.39	12 x 30	-	-	-	-
No Parking/ Restricted Parking (combined sign)	R7-200	2B.40	24 x 18 12 x 30	-	-	-	-
Tow Away Zone	R7-201,201a	2B.40	12 x 6	-	-	-	-
This Side of Sign	R7-202	2B.39	12 x 6	-	-	-	-
No Parking on Pavement	R8-1	2B.39	24 x 30	36 x 48	48 x 60	-	-
No Parking Except on Shoulder	R8-2	2B.39	24 x 30	36 x 48	48 x 60	-	-
No Parking	R8-3	2B.39	24 x 30	36 x 36	48 x 48	18 x 24	-
No Parking (symbol)	R8-3a	2B.39	24 x 24	36 x 36	48 x 48	12 x 12	-
Emergency Parking Only	R8-4	2B.42	30 x24	30 x 24	48 x 36	-	-
No Stopping on Pavement	R8-5	2B.39	24 x 30	36 x 48	48 x 60	-	-
No Stopping Except on Shoulder	R8-6	2B.39	24 x 30	36 x 48	48 x 60	-	-
Emergency Stopping Only	R8-7	2B.42	30 x 24	48 x 36	-	-	-
Do Not Stop on Tracks	R8-8	2B.42	24 x 30	36 x 48	-	-	-
Tracks Out of Service	R8-9	8B.09	24 x 24	36 x 36	-	18 x 18	-

Sign	MUTCD Code	Section	Conventional Road (in)	Expressway (in)	Freeway (in)	Minimum (in)	Oversized (in)
Stop Here When Flashing	R8-10	8B.10	24 x 36	-	-	24 x 30	-
Walk on Left Facing Traffic	R9-1	2B.43	18 x 24	-	-	-	-
Cross Only at Crosswalks	R9-2	2B.44	12 x 18	-	-	-	-
No Pedestrian Crossing	R9-3	2B.44	12 x 18	-	-	-	-
No Pedestrian Crossing (symbol)	R9-3a	2B.44	18 x 18	24 x 24	30 x 30	-	-
Use Crosswalk	R9-3b	2B.44	18 x 12	-	-	-	-
No Hitch Hiking	R9-4	2B.43	18 x 24	-	-	18 x 18	-
Hitch Hiking Prohibition (symbol)	R9-4a	2B.43	18 x 18	-	-	-	-
Bicyclists (symbol) Use Ped Signal	R9-5	9B.10	12 x 18	-	-	-	-
Bicyclists (symbol) Yield to Peds	R9-6	9B.10	12 x 18	-	-	-	-
Keep Left/Right to Pedestrians & Bicyclists (symbols) - Travel-path Restriction	R9-7	9B.11	12 x 18	-	-	-	-
Pedestrian Crosswalk	R9-8	6F.12	36 x 18	-	-	-	-
Sidewalk Closed	R9-9	6F.13	30 x18	-	-	-	-
Sidewalk Closed, Use Other Side	R9-10	6F.13	48 x 24	-	-	-	-
Sidewalk Closed Ahead, Cross Here	R9-11	6F.13	48 x 36	-	-	-	-
Sidewalk Closed, Cross Here	R9-11a	6F.13	48 x 24	-	-	-	-
Cross On Green Light Only	R10-1	2B.45	12 x 18	-	-	-	-
Pedestrian Traffic Signal Signs	R10-2, 2a,3,3a,3b, 3c,3d,4,4a,4b	2B.45	9 x12	-	-	-	-
Countdown Pedestrian Sign	R10-3e	2B.45	9 x 15	-	-	-	-
Left on Green Arrow Only	R10-5	2B.45	24 x 30	-	-	-	48 x 60
Stop Here on Red	R10-6	2B.45	24 x 36	-	-	-	-
Stop Here on Red	R10-6a	2B.45	24 x 30	-	-	-	-
Do Not Block Intersection	R10-7	2B.45	24 x 30	-	-	-	-
Use Lane with Green Arrow	R10-8	2B.45	24 x 30	36 x 42	-	-	60 x 72
Left (Right) Turn Signal	R10-10	2B.45	24 x 30		-	-	
No Turn on Red	R10-11,11a	2B.45	24 x 30	-	-	-	48 x 48
No Turn on Red	R10- 11b	2B.45	24 x 24	-	-	-	30x30
Left Turn Yield on Green	R10-12	2B.45	24 x 30	-	-	-	
Emergency Signal	R10-13	2.B45	36 x 24	-	-	-	-
Turning Traffic Must Yield To Pedestrians	R10-15	2B.45	30 x 36	-	-	-	-
U-Turn Yield to Right Turn	R10-16	2B.45	30x 36	-	-	-	-
Right on Red Arrow After Stop	R10-17a	2B.45	30 x 36	-	-	-	-
Traffic Laws Photo Enforced	R10-18	2B.46	36 x 18	48 x 30	72 x 36	-	-
Photo Enforced	R10-19	2B.46	24 x 18	36 x 30	48 x 36	-	-
MON-FRi (any times) (3 lines)	R10-20a	2B.45	24 x 24	-	-	-	-
SUNDAY (any times) (2 lines)	R10-20a	2B.45	24 x 18	-	-	-	-
Left Turn Signal - Yield on Green	R10-21	2B.45	30 x 36	-	-	-	-
Bike Actuation	R10-22	9B.12	12 x 18	-	-	-	-

Sign	MUTCD Code	Section	Conventional Road (in)	Expressway (in)	Freeway (in)	Minimum (in)	Oversized (in)
Keep Off Median	R11-1	2B.47	24 X 30	-	-	-	-
Road Closed	R11-2	2B.48	48 X 30	-	-	-	-
Road Closed – Local Traffic Only	R11-3,3a, 3b,4	2B.48	60 X 30	-	-	-	-
Weight Limit	R12-1,2	2B.49	24 X 30	36 X 48	-	-	36 X 48
Weight Limit	R12-3	2B.49	24 X 36	-	-	-	-
Weight Limit	R12-4	2B.49	36 X 24	-	-	-	-
Weight Limit	R12-5	2B.49	24 X 36	36 X 48	48 X 60		
Metric Plaque	R12-6	2B.49	24 X 9	-	-	-	-
Weigh Station	R13-1	2B.50	72 X 48	96 X 66	120 X 84	-	-
Truck Route	R14-1	2B.51	24 X 18	-	-	-	-
Hazardous Materials	R14-2,3	2B.52	24 X 24	30 X 30	36 X 36	-	42 x 42
National Network	R14-4,5	2B.53	24 X 24	30 X 30	36 X 36	-	42 x 42
Railroad Crossing	R15-1	8B.03	48 X 9	-	-	-	-
Look	R15-8	8B.16	36 X 18	-	-	-	-

Notes:
1. Larger signs may be used when appropriate.
2. Dimensions are shown in inches and shown as width x height.

Table III-09.02: Warning Sign Sizes (Table 2C-2 in the MUTCD)

Description		Conventional Road (in)	Express-way (in)	Freeway (in)	Minimum (in)	Oversized (in)
Shape	Sign Series					
Diamond	W1,W2,W7, W8,W9,W11, W14,W15-1, W17-1	30 x 30	36 x 36	48 x 48	24 x 24	-
	W1 Combination, W3,W4,W5,W6, W8-3,W10,W12	36 x 36	48 x 48	48 x 48	30 x 30	-
Rectangular	W1 - Arrows	48 x 24	-	-	36 x 18	60 x 30
	W1 - Chevron	18 x 24	30 x 36	36 x 48	12 x 18	-
	W7-4	78 x 48	78 x 48	78 x 48	-	-
	W7-4,4c	78 x 60	78 x 60	78 x 60	-	-
	W10-9,10	24 x 18	-	-	-	-
	W12-2p	84 x 24	84 x 24	84 24	-	-
	W13-2, 3, 5, W25	24 x 30	36 x 48	48 x 60	24 x 30	48 x 60
Pennant	W14-3	36 x 48 x 48	-	-	30 x 40 x 40	48 x 64 x64
Circular	W10-1	36 Dia.	48 Dia.	-	30 Dia.	48 Dia.

Notes:
1. Larger signs may be used when appropriate.
2. Dimensions are shown in inches and shown as width x height.

Table III-09.03: Minimum Size of Supplemental Warning Plaques (Table 2C-3 in the MUTCD)

Size of Warning Sign	Size of Supplemental Plaque (in)			
	Rectangular			Square
	1 Line	2 Line	Arrow	
24 x 24 30 x 30	24 x 12	24 x 18	24 x 12	18 x 18
36 x 36 48 x 48	30 x 18	30 x 24	30 x 18	24 x 24

Notes:
1. Larger supplemental plaques may be used when appropriate.
2. Dimensions are shown in inches and shown as width x height.

Table III-09.04: Minimum Sign Sizes on Low-Volume Roads (Table 5A-1 in the MUTCD)

Sign	MUTCD Code	Section	Sign Sizes (in)		
			Typical	Minimum	Oversized
Stop	R1-1	5B.02	30 x 30	-	36 x 36
Yield	R1-2	5B.02	30 x 30 x 30	_	36 x 36 x 36
Speed Limit	R2-1	5B.03	24 x 30	18 x 24	36 x 48
Do Not Pass	R4-1	5B.04	24 x 30	18 x 24	36 x 48
Pass With Care	R4-2	5B.04	24 x 30	18 x 24	36 x 48
Keep Right	R4-7	5B.04	24 x 30	18 x 24	36 x 48
Do Not Enter	R5-1	5B.04	30 x 30	-	36 x 36
No Trucks	R5.2	5B.04	24 x 24	-	30 x 30
One Way	R6-2	5B.04	18 x 24	-	24 x 30
No Parking	R8-3	5B.05	18 x 24	-	24 x 30
No Parking (symbol)	R8-3a	5B.05	24 x 24	18 x 18	30 x 30
No Parking (plaque)	R8-3c,3d	5B.05	24 x 18	18 x 12	30 x 24
Road Closed	R11-2	5B.04	48 x 30	-	-
Road Closed, Local Traffic Only	R11-3a	5B.04	60 x 30	-	-
Bridge out, Local Traffic Only	R11-3b	5B.04	60 x 30	-	-
Weight Limit	R12-1	5B.04	24 x 30	-	36 x 48
Railroad Crossbuck	R15-1	5F.02	48 x 9	-	-
Number of Tracks	R15-2	5F.02	27 x 18	-	-
Horizontal Alignment	W-1,2,3,4,5	5C.02	24 x 24	-	30 x 30
One-Direction Large Arrow	W1-6	5C.02	36 x 18	-	48 x 24
Two-Direction Large Arrow	W1-7	5C.02	36 x 18	-	48 x 24
Chevron Alignment	W1-8	5C.02	12 x 18	-	18 x 24
Intersection Warning	W2-1,4,5	5C.03	24 x 24	-	30 x 30
Stop Ahead	W3-1	5C.04	30 x 30	24 x 24	36 x 36
Yield Ahead	W3-2	5C.04	30 x 30	24 x 24	36 x 36
Be Prepared to Stop	W3-4	5G.05	36 x 36	30 x 30	48 x 48
Narrow Bridge	W5-2	5C.05	30 x 30	24 x 24	36 x 36
One Lane Bridge	W5-3	5C.06	30 x 30	24 x 24	36 x 36
Hill	W7-1,1a	5C.07	24 x 24	-	30 x 30
XX % Grade	W7-3	5C.07	24 x 18	-	30 x 24

Sign	MUTCD Code	Section	Sign Sizes (in)		
			Typical	Minimum	Oversized
Next XX miles	W7-3a	5C.09	24 x 18	-	30 x 24
Pavement Ends	W8-3	5C.08	30 x 30	24 x 24	36 x 36
Loose Gravel	W8-7	5G.05	30 x 30	24 x 24	36 x 36
Railroad Advance Warning	W10-1	5F.03	24 Dia.	18 Dia	30 Dia.
Crossing Warning	W10-2,3,4	5F.03	30 x 30	24 x 24	36 x 36
Entering/Crossing	W11 Series	5C.09	24 x 24	-	30 x 30
Advisory Speed (plaque)	W13-1	5C.10	18 x 18	-	24 x 24
Dead End/No Outlet	W14-1,2	5C.11	30 x 30	24 x 24	36 x 36
Dead End/No Outlet	W14-1a,2a	5C.11	36 x 9	24 x 6	-
No Passing Zone (pennant)	W14 -3	5G.05	30 x 40 x 40	24 x 36 x 36	36 x 48 x 48
Supplemental Distance (plaque)	W16-2	5C.09	24 x 18	18 x 12	30 x 24
Ahead (plaque)	W16-9p	5C.09	24 x 12	-	30 x 18
No Traffic Signs	W18-1	5C.12	30 x 30	24 x 24	36 x 36
Road Work XX Ft	W20-1	5G.05	36 x 36	30 x 30	48 x 48
Flagger	W20-7a	5G.05	36 x 36	30 x 30	48 x 48
Workers	W21-1a	5G.05	36 x 36	30 x 30	48 x 48
Fresh Oil	W21-2	5G.05	24 x 24	-	30 x 30
Road Machinery Ahead	W21-3	5G.05	24 x 24	-	30 x 30
Shoulder Work	W21-5	5G.05	24 x 24	-	30 x 30
Survey Crew	W21-6	5G.05	30 x 30	24 x 24	36 x 36

Notes:
1. Larger signs may be used when appropriate.
2. Dimensions are shown in inches and shown as width x height.

Table III-09.05: Size of School Area Signs and Plaques (Table 7B-1 in the MUTCD)

Sign	MUTCD Code	Section	Conventional Road (in)	Minimum (in)	Oversized (in)
School Advance Warning	S1-1	7B.08	36 x 36	30 x 30	48 x 48
School Bus Stop Ahead	S3-1	7B.10	30 x 30	-	36 x 36
Reduced Speed School Zone Ahead	S4-5,S4-5a	7B.12	36 x 36	30 x 30	48 x 48
School Speed Limit XX When Flashing	S5-1	7B.11	24 x 48	-	36 x 72
End School Zone	S5-2	7B.13	24 x 30	-	36 x 48
Speed Limit (School Use)	R2-1	7B.11	24 x 30	-	36 x 48
X:XX to X:XX AM X:XX to X:XX PM	S4-1	7B.11	24 x 10	-	36 x 18
When Children Are Present	S4-2	7B.11	24 x 10	-	36 x 18
School	S4-3	7B.11	24 x 8	-	36 x 12
When Flashing	S4-4	7B.11	24 x 10	-	36 x 18
Mon-Fri	S4-6	7B.11	24 x 10	-	36 x 18
XXX Feet	W16-2	7B.08	24 x 18	-	30 x 24
XXX Ft	W16-2a	7B.08	24 x 12	-	30 x 18
Diagonal Arrow	W16-7p	7B.09	24 x 12	-	30 x 18
Diagonal Arrow (Optional Size)	W16-7p	7B.09	21 x 15	-	-

Sign	MUTCD Code	Section	Conventional Road (in)	Minimum (in)	Oversized (in)
Ahead	W16-9p	7B.08	24 x 12	-	30 x 18

Table III-09.06: Sign Sizes for Grade Crossing Signs (Table 8B-1 in the MUTCD)

Sign	MUTCD Code	Section	Conventional Road (in)	Expressway	Freeway	Minimum	Oversized
No Right Turn Across Tracks	R3-1a	8.B.06, 10c.09	24 x 30	-	-	-	-
No Left Turn Across tracks	R3-2a	8B.06, 10C.09	24 x 30	-	-	-	-
Do Not Stop on Tracks	R8-8	8B.07, 10C.05	24 x 30	-	-	-	-
Tracks Out of Service	R8-9	8B.09, 10C.06	24 x 24	-	-	-	-
Stop Here When Flashing	R8-10	8B.10, 10C.08	24 x 36	-	-	-	-
Stop Here on Red	R10-6	8B.11, 10C.07	24 x 36	-	-	-	-
No Turn on Red	R10-11a	8D.07 10C.09	24 x 30	-	-	-	-
Highway-Rail Grade Crossing (Crossbuck)	R15-1	8B.03, 10C.02	48 x 9	-	-	-	-
Number of Tracks	R15-2	8B.03, 10C.02	27 x 18	-	-	-	-
Exempt	R15-3	8B.05, 10C.10	24 x 12	-	-	-	-
Light Rail Only Right Lane	R15-4a	10C.13	23 x 30	-	-	-	-
Light Rail Only Left Lane	R15-4b	10C.13	24 x 30	-	-	-	-
Light Rail Only Center Lane	R15-4c	10C.13	24 x 30	-	-	-	-
Light Rail Do Not Pass	R15-5	10C.14	24 x 30	-	-	-	-
Do Not Pass Stopped Train	R15-5a	10C.14	24 x 30	-	-	-	-
Do Not Drive On Tracks Light Rail Symbol	R15-6	10C.12	24 x 24	-	-	-	-
Do Not Drive On Tracks	R15-6a	10C.12	24 x 30	-	-	-	-
Light Rail Divided Highway Symbol	R15-7	10C.11	24 x 24	-	-	-	-
Light Rail Divided Highway Symbol (T-Intersection)	R15-7a	10C.11	24 x 24	-	-	-	-
Look	R15-8	8B.16, 10C.03	36 x 18	-	-	-	-
Highway-Rail Grade Crossing Advance Warning	W10-1	8B.04, 10C.15	36 Dia.	-	-	-	-
Exempt	W10-1a	8B.05, 10C.10	24 x 12	-	-	-	-
Highway-Rail Grade Crossing Advance Warning	W10-2,3,4	8B.04, 10C.15	36 x 36	-	-	-	-
Low Ground Clearance Highway-Rail Grade Crossing	W10-5	8B.17, 10C.16	36 x 36	-	-	-	-
Light Rail Activated Blank-out	W10-7	10C.17	24 x 24	-	-	-	-

Sign	MUTCD Code	Section	Conventional Road (in)	Expressway	Freeway	Minimum	Oversized
Symbol							
Trains May Exceed (80MPH)	W10-8	8B.13	36 x 36	-	-	-	-
No Train Horn	W10-9	8B.14	24 x 18	-	-	-	-
No Signal	W10-10	8B.15	24 x 18	-	-	-	-
Storage Space Symbol	W10-11	8B.18, 10C.18	36 x 36	-	-	-	-
Storage Space XX Feet Between Tracks & Highway	W10-11a	8B.18, 10C.18	30 x 36	-	-	-	-
Storage Space XX Feet Between Highway & Tracks Behind You	W10-11b	8B.18, 10C.18	30 x 36	-	-	-	-
Skewed Crossing	W10-12	8B.19, 10C.19	36 x 36	-	-	-	-
No Gates or Lights	W10-13	8B.15	24 x 18	-	-	-	-
Next Crossing	W10-14	8B.17	24 x 18	-	-	-	-
Use Next Crossing	W10-14a	8B.17	24 x 18	-	-	-	-
Rough Crossing	W10-15	8B.17	24 x 18	-	-	-	-
Light Rail Station Symbol	I-12	10C.20	24 x 24	-	-	-	-
Emergency Notification	I-13	8B.12, 10C.21	30 x 30	-	-	-	-
Emergency Notification	I-13a	8B.12, 10C.21	30 x 18	-	-	-	-

Notes:
1. Larger signs may be used when appropriate.
2. Dimensions are shown in inches and shown as width x height.

Table III-09.07: Minimum Sign Sizes for Bicycle Facilities (Table 9B-1 in the MUTCD)

Sign	MUTCD Code	Minimum Sign Size – (in)	
		Shared-Use Path	Roadway
Stop	R1-1	18 x 18	30 x 30
Yield	R1-2	18 x 18 x 18	30 x 30 x 30
Bike Lane	R3-17	-	30 x 24
Bicycle Lane Supplemental Plaques	R3-17a,b	-	30 x 12
Movement Restriction	R4-1,2,3,7	12 x 18	18 x 24
Begin Right Turn Lane Yield to Bikes	R4-4	-	36 x 30
Bicycle Wrong Way	R5-1b	12 x 18	12 x 18
No Motor Vehicles	R5-3	24 x 24	24 x 24
No Bicycles	R5-6	24 x 24	24 x 24
No Parking Bike Lane	R7-9,9a	-	12 x 18
Pedestrians Prohibited	R9-3a	18 x 18	18 x 18
Ride With Traffic Plaque	R9-3c	12 x 12	12 x 12
Bicycle Regulatory	R9-5,6	12 x 18	12 x 18
Shared-Use Path Restriction	R9-7	12 x 18	-
Push Button for Green Light	R10-3	9 x 12	9 x 12

Sign	MUTCD Code	Minimum Sign Size – (in)	
		Shared-Use Path	Roadway
To Request Green Wait on Symbol	R10-22	12 x 18	12 x 18
Railroad Crossbuck	R15-1	24 x 4.5	48 x 9
Turn and Curve Warning	W1-1,2,3,4,5	18 x 18	24 x 24
Arrow Warning	W1-6,7	24 x 12	36 x 18
Intersection Warning	W2-1,2,3,4,5	18 x 18	24 x 24
Stop, Yield, Signal Ahead	W3-1,2,3	18 x 18	30 x 30
Narrow Bridge	W5-2	18 x 18	30 x 30
Bikeway Narrows	W5-4a	18 x 18	30 x 30
Hill	W7-5	18 x 18	24 x 24
Bump or Dip	W8-1,2	18 x 18	24 x 24
Bicycle Surface Condition	W8-10	18 x 18	24 x 24
Bicycle Surface Condition Plaque	W8-10p	12 x 9	12 x 9
Advance Grade Crossing	W10-1	15 Dia.	15 Dia.
Bicycle Warning	W11-1	18 x 18	24 x 24
Pedestrian Crossing	W11-2	18 x 18	24 x 24
Low Clearance	W12-2	18 x 18	30 x 30
Playground	W15-1	18 x 18	24 x 24
Share the Road Plaque	W16-1	-	18 x 24
Diagonal Arrow Plaque	W16-7p	-	24 x 12
Bicycle Guide	D1-1b	24 x 6	24 x 6
Street Name	D1-1c	18 x 6	18 x 6
Bicycle Parking	D4-3	12 x 18	12 x 18
Bike Route	D11-1	24 x 18	24 x 18
Bicycle Route Sign	M1-8	12 x 18	12 x 18
Interstate Bicycle Route Sign	M1-9	18 x 24	18 x 24
Bicycle Route Supplemental Plaques	M4-11,12,13	12 x 4	12 x 4
Route Sign Supplemental Plaques	M7-1,2,3,4,5,6,7	12 x 9	12 x 9

II-09.02.03 Location

There are two types of locations that will vary the positions of signs.

III-09.02.03.01 Urban

In urban areas, signs are usually positioned nearer the roadway and higher above the roadway, and at closer spacing.

There may be parked vehicles or pedestrians present in urban areas, therefore the vertical clearance should be higher.

III-09.02.03.02 Rural

In rural areas, signs are usually positioned further from the roadway and at greater spacing. The horizontal and vertical placements for both urban and rural highways are shown on the sign location drawings.

III-09.03 Signing for Rural State Highway Projects (Non-Interstate)

The existing sign locations should be plotted from the sign inventory and PaveTech videos. The PaveTech videos will give the messages of the various signs. If there is a conflict between the signs shown on the sign inventory, versus those shown on the PaveTech videos, the videos should be considered correct.

A check of Stop Control or Yield Control should be made and a determination made if they are required. The existing signs should also be checked to determine if any are non-standard. See figures labeled Sign Locations and Stop Sign Location, Wide Throat Intersection in Appendix III-09 A.

Curve Signing: The warning signs such as turn sign, curve sign, reverse curve sign, etc., are part of what is known as the alignment series. See Warning Signs in Section III-09.04.

Junction Signing should be checked to determine if signs are correctly placed.

1. If Stop Ahead signs are in place and new grading will change the view of the intersection, these signs could possibly be removed. The removal of the Stop Ahead sign should be discussed with the designer and Traffic Operations in Planning.

2. If a crossroad is a state-numbered route and is not a county route, junction signing should be installed.
3. Distance and Destination (D&D) signs should be as shown on Traffic Operation Maps.

4. Route-Turn Route-Marker Assemblies should be placed across the intersecting roadway where stop or signal conditions exist.

5. Advance-Turn Route-Marker Assemblies should be placed only at intersections where the route you are on turns right or left.

The following figures, giving details on junction signing requirements, are located in Appendix III-09 A.

1. **Figures A** through **N** show junction signing requirements.

2. **Figure A** shows the junction signing required at a T-type intersection where the junctioning roadway terminates with a through Expressway roadway. A recovery approach should be installed at the location shown. If the recovery approach cannot be placed, the Double Arrow sign and the T symbol sign should be installed.

3. **Figure B** shows the junction signing required at a two lane highway that begins, a second highway that turns, and a third highway that continues through the intersection. This layout requires a junction sign and an advance turn arrow.

4. **Figure C** shows junction signing required where two state highways intersect with a third through state highway, forming a T-intersection. All are two lane two-way roadways. A recovery approach should be installed at the location shown. If the recovery approach cannot be placed, the Double Arrow sign and the T symbol sign should be installed.

5. **Figure D** shows typical intersection signing where two state highways intersect and the intersection is signalized. Both are two lane two-way roadways.

6. **Figure E** shows typical signing at a T-type intersection formed by two state highways where the junctioning roadway is the through roadway and the other turns. Both are two lane two-way roadways. This layout requires a junction sign and an advance turn arrow. A recovery approach should be installed at the location shown. If the recovery approach cannot be placed, the Double Arrow sign and the T symbol sign should be installed.

7. **Figure F** shows the intersection of a state highway and an important local road. Both are two lane two-way roadways. An advance warning sign is placed to warn of the intersection.

8. **Figure G** shows the signing requirements for an interchange ramp and a two lane, two-way county routes.

9. **Figure H** shows the signing requirements for an interchange ramp and a two lane, two-way state highways.

10. **Figure I** shows the junction signing required at T-type intersections where a county road junctions, follows the state route for a distance, then turns. This layout requires junction signs and advance turn arrows. A recovery approach should be installed at the location shown. If the recovery approach cannot be placed, the Double Arrow sign and the T symbol sign should be installed.

11. **Figure K** shows the signing for a complex intersection of county highways and a state highway. Junction signs, turn signs, and advance turn signs may be required.

12. **Figure L** shows the junction signing requirements at the intersection of a county route and a state route, with a two-way stop on the county route.

13. **Figure M** shows the junction signing requirements at a T-intersection of a county route and a through state route and with a stop on the county road. A recovery approach should be installed at the location shown. If the recovery approach cannot be placed, the Double Arrow sign and the T symbol sign should be installed.

14. **Figure N** is a Radial T-intersection showing the junction of a state route and a county or township roadway. When the route connecting with the state route is a county road, the junction sign should be installed. Where the curvature in the county route or township route is designed for a speed that is less than the posted speed, an Advisory Speed Plate should be placed below the curve sign. The Stop Ahead symbol sign should be installed when Stop signs are placed. A recovery approach should be installed at the location shown. If the recovery approach cannot be placed, the Double Arrow sign should be installed.

Transition Signing: From a divided roadway to a two lane roadway. This is shown in Figure O in Appendix III-09 A.

15. **Figure O** is the transition of a divided roadway to a two lane two-way roadway. The layout shows the required signs and their locations. The pavement marking and the delineators should also be placed as shown. Where distances between divided roadway sections is 50 miles or less, two-way signs should be installed at approximately every 7 miles along the two-way two lane roadway. The two-way signs should be placed on both sides of the roadway. Where distances between divided roadway sections is over 50 miles, two-way signs should only be placed for the traffic leaving the divided highway.

Climbing Lane Signing: Climbing lane and pavement marking for slow moving traffic. This is shown in Figure P in Appendix III-09 A.

III-09.04 Warning Signs

Warning signs should only be placed where an existing or potential hazardous condition exists.

Changes in horizontal alignment may have curve warning signs, and where the curve is hidden by vertical curvature or other conditions, the following should be followed.

Whether or not a particular curve needs to be signed is based on recommended speed at which the curve may be traversed. This speed may be determined by the use of the curves in Figure III-09.04 by the use of the ball bank indicator, or by mathematical computation.

The curves given in Figure III-09.04 are used when the radius (R) and super-elevation (e) of the curve are known. The radius and superelevation of the curve may be obtained from actual measurements or from construction plans for the roadway. The combination of radius and superelevation giving the lowest speed for the curve should be used.

The ball bank indicator is a curved level which is used to determine the safe speed around a curve as indicated by trial speed runs.

A curve with radius of more than 11,450 feet does not need a curve sign.

Where curves have radii of between 3,820 and 11,450 feet, and the sight distance is good, no curve signs may be needed. Where a curve is hidden by vertical curvature, a curve sign is needed.

Where a curve has a radius less than 3,820 feet, it should be reviewed to determine if curve signs are required by one of the methods stated above.

Intersections may be marked when the crossroad has a high volume of traffic and is hidden from the approaching traffic. An engineering study should be made to determine the need for such signing.

Reverse turn sign, Reverse curve sign, and winding road sign are intended for use where there are curves or turns separated by tangent distance of less than 600 ft.

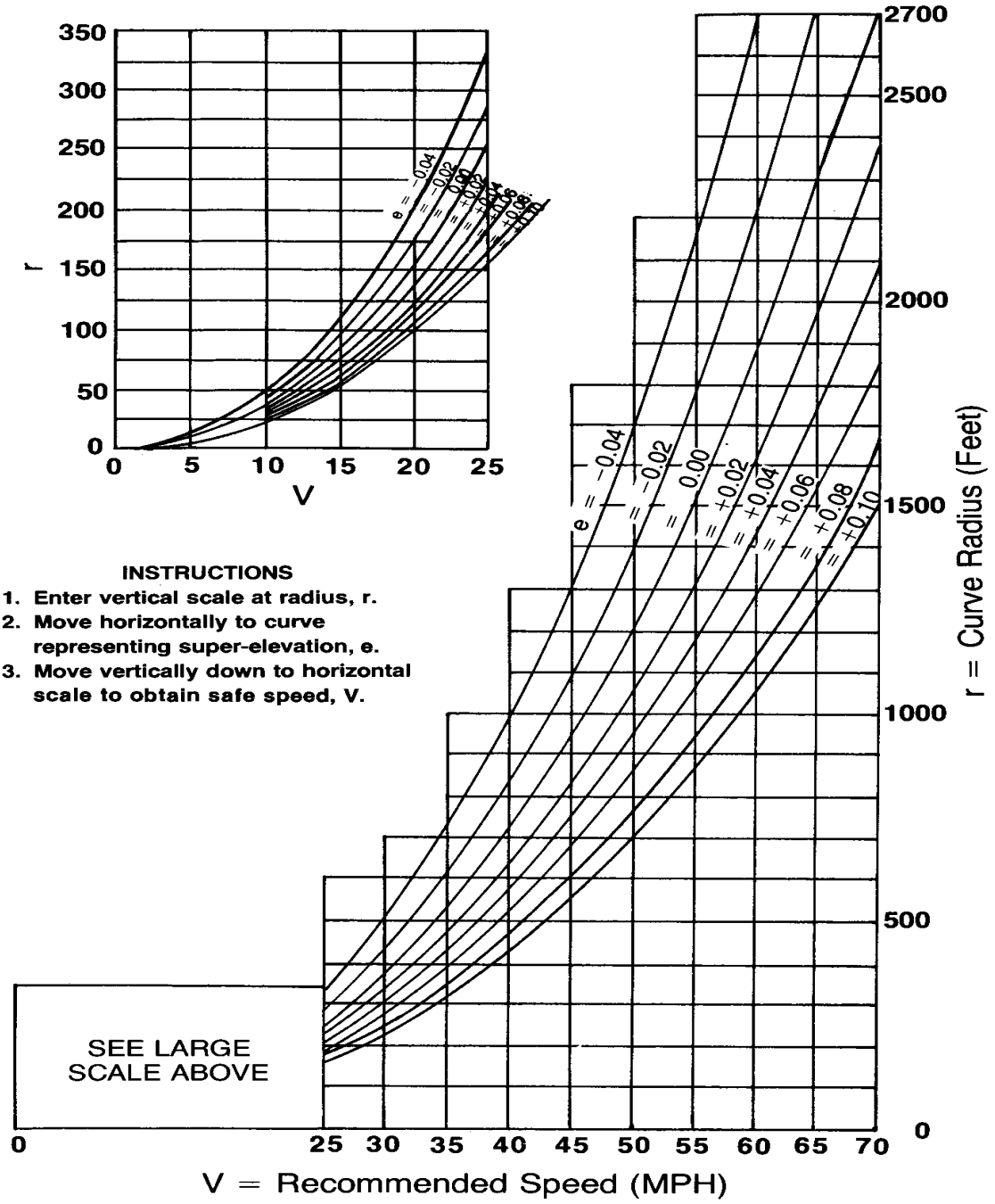

Figure III-09.04

III-09.04.01 Advance Warning of Control Devices

- Converging traffic lanes should be signed using the merge symbol when it has been determined that merging traffic is unexpected. An engineering study should be made to warrant this sign, unless it is already in place.
- Where the roadway narrows abruptly to a width that two vehicles cannot pass safely without reducing speed, a Road Narrows sign should be installed.
- Where there are changes in the highway design, such as a one lane bridge, beginning or ending of a divided highway, etc., there should be signs installed warning of such conditions.
- Where down grades have conditions such as length, percent of grade, horizontal curvature, or other physical features, the Hill sign should be installed.
- Where roadway surface conditions change, a Pavement Ends symbol and Slippery When Wet sign should be installed.
- Railroad crossings should have the advance crossing sign installed.
- Various other crossing conditions, such as bicycle, pedestrian, deer, cattle, and farm machinery, may warrant installation of warning signs.
- There are miscellaneous types of signs that may be placed to warn motorists of pending conditions. See the MUTCD for these signs.
- When lowering the speed limit for a speed zone, Reduced Speed Ahead signs should be installed prior to the change in speed limit. Guidelines for advance distance placement should be determined from Table III-09.08 (Table 2C-4 in the MUTCD).

The MUTCD provides guidance on the placement of warning signs. Chapter 2C contains Table 2C-4, Guidelines for Advance Placement of Warning Signs.

Table III-09.08 Guidelines for Advance Placement of Warning Signs (Table 2C-4 in the MUTCD)

Posted or 85th-Percentile Speed	**Advance Placement Distance[1]**								
	Condition A: Speed reduction and lane changing in heavy traffic[2]	Condition B: Deceleration to the listed advisory speed (mph) for condition[4]							
		0[3]	10	20	30	40	50	60	70
20 mph	225 ft	N/A[5]	N/A[5]	-	-	-	-	-	-
25 mph	325 ft	N/A[5]	N/A[5]	N/A[5]	-	-	-	-	-
30 mph	450 ft	N/A[5]	N/A[5]	N/A[5]	-	-	-	-	-
35 mph	550 ft	N/A[5]	N/A[5]	N/A[5]	N/A[5]	-	-	-	-
40 mph	650 ft	125 ft	N/A[5]	N/A[5]	N/A[5]	-	-	-	-
45 mph	750 ft	175 ft	125 ft	N/A[5]	N/A[5]	N/A[5]	-	-	-
50 mph	850 ft	250 ft	200 ft	150 ft	100 ft	N/A[5]	-	-	-
55 mph	950 ft	325 ft	275 ft	225 ft	175 ft	100 ft	N/A[5]	-	-

Posted or 85th-Percentile Speed	**Advance Placement Distance[1]**								
	Condition A: Speed reduction and lane changing in heavy traffic[2]	Condition B: Deceleration to the listed advisory speed (mph) for condition[4]							
		0[3]	10	20	30	40	50	60	70
60 mph	1100 ft	400 ft	350 ft	300 ft	250 ft	175 ft	N/A[5]	-	-
65 mph	1200 ft	475 ft	425 ft	400 ft	350 ft	275 ft	175 ft	N/A[5]	-
70 mph	1250 ft	550 ft	525 ft	500 ft	425 ft	350 ft	250 ft	150 ft	-
75 mph	1350 ft	650 ft	625 ft	600 ft	525 ft	450 ft	350 ft	250 ft	100 ft

1. The distances adjusted for a sign legibility distance of 175 ft for Condition A. The distance for Condition B has been adjusted for a sign legibility distance of 250 ft, which is appropriate for an alignment warning symbol sign.

2. Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends. The distances are determined by providing the driver a PIEV time of 14.0 to 14.5 seconds for vehicle maneuvers (2001 AASHTO Policy, Exhibit 3-3, Decision Sight Distance, Avoidance Maneuver E) minus the legibility distance of 175 ft for the appropriate sign.

3. Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Warning signs. The distances are based on the 2001 AASHTO Policy, Stopping Sight Distance, Exhibit 3-1, providing a PIEV time of 2.5 seconds, a deceleration rate of 11.2 ft/sec^2, minus the sign legibility distance of 175 ft.

4. Typical conditions are locations where the road user must decrease speed to maneuver through the warning condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 seconds PIEV time, a vehicle deceleration rate of 10 ft/sec^2, minus the sign legibility distance of 250 ft.

5. No suggested distances are provided for these speeds, as the placement location is dependent on site conditions and other signing to provide an adequate advance warning to the driver.

III-09.05 Guide Signs

Guide signs are essential to guide vehicle operators along streets and highways, to inform them of interesting routes, to direct them to cities, towns, villages, or other important destinations, to identify nearby rivers and streams, parks, forests, and historic sites, and generally give such information as will help them along their way in the most simple, direct manner possible.

Guide signs on conventional roads are covered in the MUTCD, Parts 2D.

Cities may be signed by placing city signs on either end of a community.

Historical areas may be signed if an engineering study warrants the installation of such signing. Service signing may be signed if an engineering study warrants its installation.

The airport Symbol signs shall point in the direction of the airport.

III-09.06 Regulatory Signs

Regulatory signs inform highway users of traffic laws or regulations and indicate the applicability of legal requirements that would not otherwise be apparent. These signs should be erected wherever needed to fulfill this purpose, but unnecessary mandates should be avoided. Some North Dakota laws specify that certain regulations are enforceable only when made known by official signs, such as special speed limit zones, handicap parking areas, etc.

The MUTCD covers regulatory signing in Chapter 2B.

North Dakota state laws prescribe the following speed limits:

- Speed limit on Interstate routes is 75 mph, unless otherwise posted.
- Speed limit on Expressway routes is 70 mph, unless otherwise posted.
- Speed limit on US and state routes is 65 mph day, unless otherwise posted.
- Speed limit on all highways and streets in business or residential districts is 25 mph, unless posted otherwise.

These regulations generally result in the need for speed limit signing only at major intersections or entrances to highways, and at locations where speed limits change or are different than that specified by law. State law also limits speed limit change increments to a maximum of 20 mph. Locations where the speed limit changes more than 20 mph, therefore, require intermediate speed signs.

Speed Limits signs should be located at the point where the limit changes. Speed Limits signs should also be located at entrances and or boundaries to metropolitan areas.

III-09.06.1 Typical Speed Zone Signing

Rural. When multiple Speed Limits are used to decrease speeds, the signs should be placed at distances corresponding to the amount of speed change and the initial speed. Table III-09.09 indicates spacing between successive Speed Limit signs when the speeds are being reduced based on comfortable deceleration. See **Figure R** for placement of signs. If the reduction of speed limits must have more signs than are shown because of State Law, additional signs on both sides of the roadway will be required accordingly.

The speed limit on projects should be reviewed by opening the RIMS#HP program and the speed limit signs should be placed at the location shown. If project require the repositioning the speed limit signs, the new position shall be provided to the Traffic Operations Section, Planning Division.

Urban The speed limit on urban projects should be reviewed with the city personnel.

Table III-09.09 Minimum Speed Signing Placement

		Approach Speed (mph)								
		70	65	60	55	50	45	40	35	30
Reduced Speed (mph)	65	430								
	60	720	390							
	55	1000	660	350						
	50	1250	910	600	310					
	45	1470	1140	820	540	270				
	40	1670	1340	1030	740	470	230			
	35	1850	1520	1200	920	650	410	200		
	30	2000	1670	1360	1070	810	570	350	160	
	25	2140	1800	1490	1200	940	700	480	290	120
	20	2240	1910	1600	1310	1040	800	590	390	230
	15	2340	1990	1680	1390	1130	890	670	480	310

- Distances are rounded to the nearest interval of 10 ft.
- Based on 2 sec of PIEV time, vehicle deceleration/acceleration rate of 2.3 ft/sec^2 (typical deceleration in gear braking), and legibility distance of 100 ft.
- Good engineering practice indicates that speed reduction through a speed zone should be signed at intervals no greater than 15 mph. The gray shaded numbers are speed reductions greater than 15 mph.

State law specifies standard signing and marking for handicap parking, including an advisement of the fine for the improper use of such parking areas. Also, state law specifies that vehicles may not be parked on the paved or main traveled portions of any rural highway, so it generally is not necessary to place parking restriction signs in rural areas unless a special problem exists.

Other mandatory signing are specified by Century Code.

Stop sign usage generally requires Stop signs on all side road approaches to state highways, such as graded section line roads, township and county routes, city streets, commercial drives, etc. Generally, field drives and single party private drives carry minimal traffic and do not require signing.

Warrants for other types of regulatory signs are included in the MUTCD and should generally be followed when determining the need for this type of signing.

III-09.07 Sign Placement

The typical section should be used to determine the position of signs on the side of the roadway. Perforated tube supports are placed on the foreslope of the roadway. Standard pipe are placed on the foreslope, secondary slope, flat ditch bottom, backslope, or original ground. This information should be obtained for the design of the sign supports. This will be discussed further in subsequent paragraphs.

III-09.07.01 Lateral Offset

- **All Highways** – Signs should be 6 feet minimum from the edge of the finished shoulder and 60 feet maximum from the center of the sign to the edge of the driving lane.

- **Interstate** – Signs should be 6 feet from the finished shoulder for regulatory signs, warning signs, and route markers. Variable message guide signs are normally placed at 60 feet from the edge of the driving lane. If the roadside conditions will not allow this placement, place them on the foreslope 6 feet from the finished shoulder.

- **Expressways & Conventional Roadways** – Signs should be16 feet from the edge of the driving lane.

- **Bikeways** – Signs should be 3 feet minimum and 6 feet maximum from edge of bikeway.

III-09.07.02 Mounting Height

Standard:

1. Signs installed at the side of the road in rural districts shall be at least 5 feet and a maximum of 6 feet, measured from the bottom of the sign to the near edge of the driving lane. Where parking or pedestrian movements occur, the clearance to the bottom of the sign shall be at least 7 feet and a maximum of 8 feet.

2. Directional signs on expressway and freeways shall be installed with a minimum height of 7 feet and a maximum of 8 feet. If a secondary sign is mounted below another sign, the major sign shall be installed at least 8 feet and a maximum of 9 feet and the secondary sign at least 5 feet and a maximum of 6 feet above the level of the edge of the driving lane. All route signs, warning signs, and regulatory signs on expressways and freeways shall be at least 7 feet and a maximum of 8 feet above the level of the edge of the driving lane.

3. Overhead mounted signs shall provide a vertical clearance of not less than 19 feet to the sign, light fixture, walkway, or sign bridge, over the entire width of the pavement and shoulders except where a lesser vertical clearance is used for design of other structures.

4. Where signs are placed 30 feet or more from the edge of the travel way, the height to the bottom of such signs may be 5 feet and a maximum of 6 feet above the level of the edge of the driving lane.

5. Mounting height from the ground-mounted signs on shared-use paths shall be a minimum of 4 feet and a maximum of 5 feet, measured from bottom edge of the sign to the near edge of the paved surface.

6. When overhead signs are used on a shared-use path, the clearance from the bottom edge of the sign to the path surface directly under the sign shall be a minimum of 8 ft.

III-09.08 Sign Face Design

The sign face layouts for standard signs, such as Regulatory, Warning, and Route Markers, are found in the Standard Highway Signs Booklet and the North Dakota Supplement.

The variable message signs, such as Distance & Destination signs, Services Signing, Weigh Station Signing, Historical Areas Signing, Recreational Areas Signing, Street Name Signing, etc., should be designed using the GuidSign Program with the following requirements:

Radius:
Sign Height: 0 to 24 inches (2 ft) ----------Use 3 inch radius
Over 24 (2 ft) to 48 inches (4 ft) ----------Use 6 inch radius
Over 48 (4 ft)to 72 inches (6 ft) ----------Use 9 inch radius
Over 72 inches (6 ft) and over ---------- Use 12 inch radius
Border:
Major Lettering Text Height:* 0.0 to 9.9 inches----------Use 1.25 inch border
10 to 14.9 inches ----------Use 2.0 inch border
15 inches and larger ----------Use 3.0 inch border

* **Exceptions:** Exit Panels - Use 1.25 inch Border
Gore Signs - Use 2 Inch Border

All letters on Variable Message Signs should be Clearview Highway Font.

Distance and Destination signs on conventional roads should have 6" Upper Case and 4 1/2" Lower Case letters.

Variable Message Signs for Expressways and Freeways should be as follows: The in-place signs should be checked to determine if they comply with the legend requirements in Sections

III-09.08.01 and III-09.08.02. If not, they should be replaced

III-09.08.01 Expressways

The word messages in the legends of expressway guide signs should be in letters at least 8 inches high. Larger lettering is necessary for major guide signs. The following table is Table 2E-1: Minimum Letter and Numeral Sizes for Expressway Guide Signs According to Interchange Classification, in the MUTCD.

Type of Sign	Type of Interchange (See Appendix III-09 B1 & B2)				Overhead
	Major		Intermediate	Minor	
	Category a	Category b			
A. Advance Guide, Exit Direction, and Overhead Guide Signs					
Exit Plaque					
Word	10	10	10	8	10
Numeral & Letter	15	15	15	12	15
Interstate Route Sign					
Numeral	18	-	-	-	18
1- or 2-Digit Shield	36 x 36	-	-	-	36 x 36
3-Digit Shield	45 x 36	-	-	-	45 x 36
US or State Route Shield					
Numeral	18	18	18	12	18
1- or 2-Digit Shield	36 x 36	36 x 36	36 x 36	24 x 24	36 x 36
3-Digit Shield	45 x 36	45 x 36	45 x 36	30 x 24	45 x 36
Cardinal Direction					
First Letter	18	15	12	10	15
Rest of Word	15	12	10	8	12
Name of Destination					
Upper-Case Letters	20	16	13.3	10.6	16
Lower-Case Letters	15	12	10	8	12
Distance Number	18	15	12	10	15
Distance Fraction	12	10	10	8	10
Distance Word	12	10	10	8	10
Action Message Word	10	10	10	8	10
B. Gore Signs					
Word	10	10	10	8	-

Type of Sign	Type of Interchange (See Appendix III-09 B1 & B2)				Overhead
	Major		Intermediate	Minor	
	Category a	Category b			
Numeral & Letter	12	12	12	10	-

See Section 2E.29, MUTCD, Interchange Classification. The following table is Table 2E-2: Minimum Letter and Numeral Sizes for Expressway Guide Signs According to Sign Type in the MUTCD.

Type of Sign	Minimum Size (inches)	Type of Sign	Minimum Size (inches)
A. Pull Through Signs		**F. Distance Signs**	
Destination – Upper-Case Letters	13.3	Word – Upper-Case Letters	8
Destination – Lower-Case Letters	10	Word – Lower-Case Letters	6
Route Sign as Message		Numeral	8
Cardinal Direction	10	**G. General Services Signs**	
1- or 2-Digit Shield	36 x 36	Exit Number Word	8
3-Digit Shield	45 x 36	Exit Number Numeral and Letter	12
B. Supplemental Guide Signs		Services	8
Exit Number Word	8	**H. Rest Area and Scenic Area Signs**	
Exit Number Numeral and Letter	12	Word	10
Place Name – Upper-Case Letters	10.6	Distance Numeral	12
Place Name – Lower-Case Letters	8	Distance Fraction	8
Action Message	8	Distance Word	10
C. Changeable Message Signs		Action Message Word	10
Characters	10.6*	**I. Reference Location Signs**	
D. Interchange Sequence Signs		Word	4
Word – Upper-Case Letters	10.6	Numeral	10
Word – Lower-Case Letters	8	**J. Boundary and Orientation Signs**	
Numeral	10	Word – Upper-Case Letters	8
Fraction	8	Word – Lower-Case Letters	6
E. Next X Exits Sign		**K. Next Exit and Next Services Signs**	
Place Name – Upper-Case Letters	10.6	Word and Numeral	8
Place Name – Lower-Case Letters	8	**L. Exit Only Signs**	

Type of Sign	Minimum Size (inches)	Type of Sign	Minimum Size (inches)
NEXT X EXITS	8	Word	12

*Changeable Message Signs may often require larger sizes than the minimum. A size of 18 in should be used where traffic speeds are greater than 55 mph, in areas of persistent inclement weather, or where complex driving tasks are involved.

III-09.08.02 Freeways

The word messages in the legends of Freeway guide signs should be in letters at least 8 inches high. Larger lettering is necessary for major guide signs. The following table is Table 2E-3: Minimum Letter and Numeral Sizes for Freeway Guide Signs According to Interchange Classification in the MUTCD.

Type of Sign	Type of Interchange (See Appendix III-09 B1 & B2)				Overhead
	Major		Intermediate	Minor	
	Category a	Category b			
A. Advance Guide, Exit Direction, and Overhead Guide Signs					
Exit Plaque					
Word	10	10	10	10	10
Numeral & Letter	15	15	15	15	15
Interstate Route Sign					
Numeral	24/18	-	-	-	18
1- or 2-Digit Shield	48x48/36x36	-	-	-	36 x 36
3-Digit Shield	60x48/45x36	-	-	-	45 x 36
US or State Route Sign					
Numeral	24/18	18	18	12	18
1- or 2-Digit Shield	48x48/36x36	36 x 36	36 x 36	24 x 24	36 x 36
3-Digit Shield	60x48/45x36	45 x 36	45 x 36	30 x 24	45 x 36
Cardinal Direction					
First Letter	18	12	15	10	15
Rest of Word	15	12	12	8	12
Name of Destination					
Upper-Case Letters	20	20	16	13.3	16
Lower-Case Letters	15	15	12	10	12
Distance Number	18	18/15	15	12	15

Type of Sign	Type of Interchange (See Appendix III-09 B1 & B2)				Overhead
	Major		Intermediate	Minor	
	Category a	Category b			
Distance Fraction	12	12/10	10	8	10
Distance Word	12	12/10	10	8	10
Action Message Word	12	12/10	10	8	10
B. Gore Signs					
Word	12	12	12	8	-
Numeral & Letter	15	15	15	10	-

Note: (/) Slant bar signifies seperation of desirable and minimum sizes.

See Section 2E.29, MUTCD, Interchange Classification. The following table is Table 2E-2: Minimum Letter and Numeral Sizes for Freeway Guide Signs According to Sign Type in the MUTCD.

Type of Sign	Minimum Size (inches)	Type of Sign	Minimum Size (inches)
A. Pull Through Signs		**G. General Services Signs**	
Destination – Upper-Case Letters	16	Exit Number Word	10
Destination – Lower-Case Letters	12	Exit Number Numeral and Letter	15
Route Sign as Message		Services	10
Cardinal Direction	12	**H. Rest Area and Scenic Area Signs**	
1- or 2-Digit Shield	36 x 36	Word	12
3-Digit Shield	45 x 36	Distance Numeral	15
B. Supplemental Guide Signs		Distance Fraction	10
Exit Number Word	10	Distance Word	12
Exit Number Numeral and Letter	15	Action Message Word	12
Place Name – Upper-Case Letters	13.3	**I. Reference Location Signs**	
Place Name – Lower-Case Letters	10	Word	4
Action Message	10	Numeral	10
C. Changeable Message Signs		**J. Boundary and Orientation Signs**	
Characters	10.6*	Word – Upper-Case Letters	8
D. Interchange Sequence Signs		Word – Lower-Case Letters	6
Word – Upper-Case Letters	13.3	**K. Next Exit and Next Services Signs**	

Type of Sign	Minimum Size (inches)	Type of Sign	Minimum Size (inches)
Word – Lower-Case Letters	10	Word and Numeral	8
Numeral	13.3	**L. Exit Only Signs**	
Fraction	10	Word	12
E. Next X Exits Sign		**M. Diagrammatic Signs**	
Place Name – Upper-Case Letters	13.3	Lane Widths	5
Place Name – Lower-Case Letters	10	Lane Line Segments	1 x 6
NEXT X EXITS	10	Gap Between Lane Lines	6
F. Distance Signs		Stem Height (up to upper point of departure)	30
Word – Upper-Case Letters	8	Arrowhead (standard "up" arrow)	8
Word – Lower-Case Letters	6	Space Between Arrowhead & Route Shield	12
Numeral	8		

*Changeable Message Signs may often require larger sizes than the minimum. A size of 18 in should be used where traffic speeds are greater than 55 mph, in areas of persistent inclement weather, or where complex driving tasks are involved.

III-09.08.03 Interline and Edge Spacing

Interline spacing of upper-case letters should be approximately 3/4 the average of the upper-case letter heights in the adjacent lines of letters.

The spacing to the top and bottom borders should be approximately equal to the average of the letter height of the adjacent line of letters. The lateral spacing to the vertical border should be essentially the same as the height of the largest letter.

III-09.08.04 Arrows

On all exit direction signs, both overhead and ground-mounted, arrows should be upward slanting and located on side of the sign where the exit leaves the mainline.

Downward pointing arrows are lane assignment arrows and should only be used on overhead guide signs to prescribe the use for specific lanes for traffic bound for a destination or route that can be reached only by being in the lane(s) so designated.

Examples of arrows for use on guide signs are shown on Standard Drawing D-754-9.

III-09.08.05 Gore Sign Location

The placement of gore signs should be as shown on Standard Drawing D-754-1.

III-09.09 Sign Support Design

Sign supports are designed using the requirements of the Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

The type of post used on conventional roads and expressways should be perforated tube, unless the sign configuration does not allow the use of this type. If the design requirements cannot be met using perforated tube posts, the sign supports should be standard pipe or W-shape posts.

On Interstate highways, sign supports should be standard pipe or W-shape. Single post signs should use standard pipe with concrete foundations. Gore signs should use standard pipe with concrete foundations. All other signs should use two or more W-shape posts on piling.

Conventional highways should have sign supports designed using the sections shown on Standard Drawing D-754-23.

For information to calculate sign supports, see Appendix III-09 D or on the web at http://www.dot.nd.gov/manuals/manuals-publications.htm under Sign Caluclator.

III-09.10 Sign Retroreflective Requirements

The retroreflective material used in the fabrication of sign faces should be either Type IV or Type XI sheeting.

Type IV reflective sheeting should be used on all signs except the following:

- Type XI sheeting should be used on all regulatory and warning sings (including school signs).