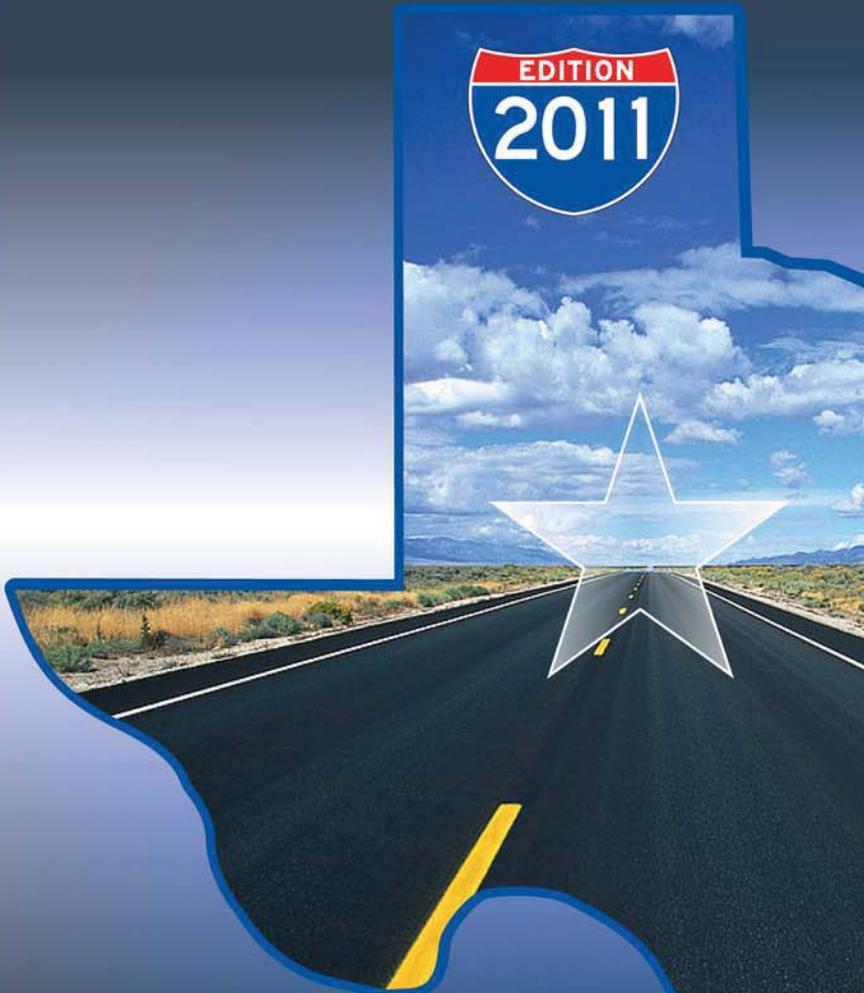


Texas MUTCD

Manual on Uniform Traffic Control Devices

Revision 2, October 2014



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Table 2B-1. Regulatory Sign and Plaque Sizes (Sheet 4 of 5)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	** Multi-Lane				
Turning Vehicles Yield to Peds	R10-15	2B.53	30 x 30	30 x 30	—	—	—	—
U-Turn Yield to Right Turn	R10-16	2B.53	30 x 36	30 x 36	—	—	—	—
Right on Red Arrow After Stop	R10-17a	2B.54	30 x 36	30 X 36	—	—	—	—
Left Turn Yield on Flashing Yellow Arrow	R10-17T	2B.53	30 x 30	36 x 42	—	—	—	—
Photo Enforced	R10-18a	2B.55	30 x 42	36 x 54	—	—	—	—
MON—FRI (and times) (3 lines) (plaque)	R10-20aP	2B.53	24 x 24	24 x 24	—	—	—	—
SUNDAY (and times) (2 lines) (plaque)	R10-20aP	2B.53	24 x 18	24 x 18	—	—	—	—
Crosswalk, Stop on Red	R10-23	2B.53	24 x 30	24 x 30	—	—	—	—
Push Button To Turn On Warning Lights	R10-25	2B.52	9 x 12	9 x 12	—	—	—	—
Left Turn Yield on Flashing Red Arrow After Stop	R10-27	2B.53	30 x 36	30 x 36	—	—	—	—
XX Vehicles Per Green	R10-28	2B.56	24 x 30	24 x 30	—	—	—	—
XX Vehicles Per Green Each Lane	R10-29	2B.56	36 x 24	36 x 24	—	—	—	—
Right Turn on Red Must Yield to U-Turn	R10-30	2B.54	30 x 36	30 x 36	—	—	—	—
At Signal (plaque)	R10-31P	2B.53	24 x 9	24 x 9	—	—	—	—
Push Button for 2 Seconds for Extra Crossing Time	R10-32P	2B.52	9 x 12	9 x 12	—	—	—	—
Keep Off Median	R11-1	2B.57	24 x 30	24 x 30	—	—	—	—
Road Closed	R11-2	2B.58	48 x 30	48 x 30	—	—	—	—
Bridge, Ramp, Street Closed	R11-2aT, 2bT, 2cT	2B.58	48 x 30	48 x 30	—	—	—	—
Road Closed - Local Traffic Only	R11-3a,3b,4	2B.58	60 x 30	60 x 30	—	—	—	—
Weight Limit	R12-1,2	2B.59	24 x 30	24 x 30	36 x 48	—	—	36 x 48
Weight Limit	R12-1T	2B.59	24 x 36	24 x 36	—	—	—	—
Weight Limit	R12-2cT	2B.59	24 x 36	24 x 36	—	—	—	—
Weight Limit	R12-3	2B.59	24 x 36	24 x 36	—	—	—	—
Weight Limit	R12-4	2B.59	36 x 24	36 x 24	—	—	—	—
Weight Limit	R12-4aT	2B.59	24 x 36	24 x 36	—	—	—	—
Load Zoned Bridge	R12-6aT	2B.59	Var x 36	Var x 36	—	—	—	—
Load Zoned Road	R12-6bT	2B.59	Var x 30	Var x 30	—	—	—	—
Load Zoned Road	R12-7aT	2B.59	Var x 36	Var x 36	—	—	—	—
Load Zoned Road	R12-7bT	2B.59	Var x 30	Var x 30	—	—	—	—
Load Zoned Road	R12-8aT	2B.59	78 x 36	78 x 36	—	—	—	—
Load Zoned Road	R12-8bT, 8cT	2B.59	78 x 24	78 x 24	—	—	—	—
Width Limit	R12-9T	2B.59A	24 x 36	—	—	—	—	—
Width Limit	R12-9aT	2B.59A	—	48 x 60	48 x 60	48 x 60	—	—
All Commercial Vehicles and Buses Stop Ahead when Flashing	R13-1T	2B-60	72 x 48	72 x 48	96 x 60	96 x 60	—	—
All Trucks Must Stop Ahead	R13-1aT	2B-60	48 x 36	48 x 36	48 x 36	48 x 36	—	—
Trucks-Buses Must Stop Ahead	R13-1bT	2B-60	60 x 36	60 x 36	60 x 36	60 x 36	—	—
All Trucks Next Right When Flashing	R13-1cT	2B-60	48 x 48	48 x 48	78 x 60	78 x 60	—	—
All Trucks Next Right	R13-1TP	2B-60	72 x 30	72 x 30	144 x 48	144 x 48	—	—
All Vehicles Must Stop Ahead	R13-2T	2B-60	90 x 72	90 x 72	90 x 72	90 x 72	—	—
Use Low Beams	R13-3T	2B-60	60 x 30	60 x 30	60 x 30	60 x 30	—	—
Truck Route	R14-1	2B.61	24 x 18	24 x 18	—	—	—	—
Hazardous Material	R14-2,3	2B.62	24 x 24	24 x 24	30 x 30	36 x 36	—	42 x 42
Fender Bender Move Vehicles	R16-4	2B.65	36 x 24	36 x 24	48 x 36	60 x 48	—	48 x 36
Must Follow	R14-6T	2B.62A	216 x 96	216 x 96	216 x 96	216 x 96	—	—
Stop for School Bus Loading or Unloading	R19-1T	2B.68A	48 x 60	48 x 60	—	—	—	—
No Dumping Allowed	R19-5T	2B.68A	24 x 30	24 x 30	—	—	—	—

* See Table 9B-1 for minimum size required for signs on bicycle facilities.
 ** State Maintained conventional roadways should use Multi-Lane as standard.
 Notes: 1. Larger signs may be used when appropriate.
 2. Dimensions in inches are shown as width x height.

Table 2B-1. Regulatory Sign and Plaque Sizes (Sheet 5 of 5)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	** Multi-Lane				
Littering Prohibited \$10-2000 Fine	R19-6T	2B.68A	48 x 30	48 x 30	48 x 30	48 x 30	—	—
Don't Mess With Texas	R19-6aT	2B.68A	48 x 30	48 x 30	48 x 30	48 x 30	—	—
No Fishing From Bridge	R19-7T	2B.68A	24 x 30	24 x 30	48 x 60	48 x 60	—	—
Fasten Safety Belts	R19-8T	2B.66	30 x 30	30 x 30	48 x 48	48 x 48	—	—
Next X Miles	R20-1TP	2B.68A	24 x 18	24 x 18	—	—	—	—
X Miles Ahead	R20-4TP	2B.59A	24 x 12	48 x 24	—	—	—	—

* See Table 9B-1 for minimum size required for signs on bicycle facilities.

** State Maintained conventional roadways should use Multi-Lane as standard.

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

07 **Where side roads intersect a multi-lane street or highway that has a speed limit of 45 mph or higher, the minimum size of the STOP signs facing the side road approaches, even if the side road only has one approach lane, shall be 36 x 36 inches.**

08 **Where side roads intersect a multi-lane street or highway that has a speed limit of 40 mph or lower, the minimum size of the STOP signs facing the side road approaches shall be as shown in the Single Lane or Multi-lane columns of Table 2B-1 based on the number of approach lanes on the side street approach.**

Guidance:

09 *The minimum sizes for regulatory signs facing traffic on exit and entrance ramps should be as shown in the column of Table 2B-1 that corresponds to the mainline roadway classification (Expressway or Freeway). If a minimum size is not provided in the Freeway column, the minimum size in the Expressway column should be used. If a minimum size is not provided in the Freeway or Expressway Column, the size in the Oversized column should be used.*

Section 2B.04 Right-of-Way at Intersections

Support:

01 The Texas Transportation Code, Section 545.151 (see Section 1A.11) establishes the right-of-way rule at intersections having no regulatory traffic control signs such that the driver of a vehicle approaching an intersection must yield the right-of-way to any vehicle or pedestrian already in the intersection. When two vehicles approach an intersection from different streets or highways at approximately the same time, the right-of-way rule requires the driver of the vehicle on the left to yield the right-of-way to the vehicle on the right. The right-of-way can be modified at through streets or highways by placing YIELD (R1-2) signs (see Sections 2B.08 and 2B.09) or STOP (R1-1) signs (see Sections 2B.05 through 2B.07) on one or more approaches.

Guidance:

02 *Engineering judgment should be used to establish intersection control. The following factors should be considered:*

- A. *Vehicular, bicycle, and pedestrian traffic volumes on all approaches;*
- B. *Number and angle of approaches;*
- C. *Approach speeds;*
- D. *Sight distance available on each approach; and*
- E. *Reported crash experience.*

03 *YIELD or STOP signs should be used at an intersection if one or more of the following conditions exist:*

- A. *An intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;*
- B. *A street entering a designated through highway or street; and/or*
- C. *An unsignalized intersection in a signalized area.*

04 *In addition, the use of YIELD or STOP signs should be considered at the intersection of two minor streets or local roads where the intersection has more than three approaches and where one or more of the following conditions exist:*

- A. *The combined vehicular, bicycle, and pedestrian volume entering the intersection from all approaches averages more than 2,000 units per day;*
- B. *The ability to see conflicting traffic on an approach is not sufficient to allow a road user to stop or yield in compliance with the normal right-of-way rule if such stopping or yielding is necessary; and/or*

CHAPTER 2C. WARNING SIGNS AND OBJECT MARKERS

Section 2C.01 Function of Warning Signs

Support:

- 01 Warning signs call attention to unexpected conditions on or adjacent to a highway, street, or private roads open to public travel and to situations that might not be readily apparent to road users. Warning signs alert road users to conditions that might call for a reduction of speed or an action in the interest of safety and efficient traffic operations.

Section 2C.02 Application of Warning Signs

Standard:

- 01 **The use of warning signs shall be based on an engineering study or on engineering judgment.**

Guidance:

- 02 *The use of warning signs should be kept to a minimum as the unnecessary use of warning signs tends to breed disrespect for all signs. In situations where the condition or activity is seasonal or temporary, the warning sign should be removed or covered when the condition or activity does not exist.*

Option:

- 03 Consistent with the provisions of Chapter 2L, changeable message signs may be used to display a warning message.
- 04 Consistent with the provisions of Chapter 4L, a Warning Beacon may be used in combination with a standard warning sign.

Support:

- 05 The categories of warning signs are shown in Table 2C-1.
- 06 Warning signs provided in this Manual cover most of the conditions that are likely to be encountered. Additional warning signs for low-volume roads (as defined in Section 5A.01), temporary traffic control zones, school areas, grade crossings, and bicycle facilities are discussed in Parts 5 through 9, respectively.
- 07 Section 1A.09 contains information regarding the assistance that is available to jurisdictions that do not have engineers on their staffs who are trained and/or experienced in traffic control devices.

Section 2C.03 Design of Warning Signs

Standard:

- 01 **Except as provided in Paragraph 2 or unless specifically designated otherwise, all warning signs shall be diamond-shaped (square with one diagonal vertical) with a black legend and border on a yellow background. Warning signs shall be designed in accordance with the sizes, shapes, colors, and legends contained in the “Standard Highway Sign Designs for Texas” book (see Section 1A.11).**

Option:

- 02 A warning sign that is larger than the size shown in the Oversized column in Table 2C-2 for that particular sign may be diamond-shaped or may be rectangular or square in shape.
- 03 Except for symbols on warning signs, minor modifications may be made to the design provided that the essential appearance characteristics are met. Modifications may be made to the symbols shown on combined horizontal alignment/intersection signs (see Section 2C.11) and intersection warning signs (see Section 2C.46) in order to approximate the geometric configuration of the intersecting roadway(s).
- 04 Word message warning signs other than those provided in this Manual may be developed and installed by State and local highway agencies.
- 05 Warning signs regarding conditions associated with pedestrians and playgrounds may have a black legend and border on a yellow or fluorescent yellow-green background.

Standard:

- 06 **Warning signs regarding conditions associated with school buses and schools and their related supplemental plaques shall have a black legend and border on a fluorescent yellow-green background (see Section 7B.07).**

Section 2C.04 Size of Warning Signs

Standard:

- 01 **Except as provided in Section 2A.11, the sizes for warning signs shall be as shown in Table 2C-2.**

Table 2C-1. Categories of Warning Signs and Plaques

Category	Group	Section	Signs or Plaques	Sign Designations
Roadway Related	Changes in Horizontal Alignment	2C.07	Turn, Curve, Reverse Turn, Reverse Curve, Winding Road, Hairpin Curve, Curve Blocks View, 270-Degree Curve	W1-1,2,3,4,5,11,11T,11TP, 15
		2C.08	Advisory Speed	W13-1P
		2C.09	Chevron Alignment	W1-8
		2C.10	Combination Horizontal Alignment/Advisory Speed	W1-1a,2a
		2C.11	Combination Horizontal Alignment/Intersection	W1-10,10a,10b,10c,10d
		2C.12	Large Arrow (one direction), Chevron Large Arrow (one direction)	W1-6, 9T
		2C.13	Truck Rollover	W1-13
		2C.14	Advisory Exit or Ramp Speed	W13-2,3
		2C.15,15A	On Ramp,Combination Horizontal Alignment/Advisory Exit, or Ramp Speed	W13-4P,6,7
	Vertical Alignment	2C.16	Hill	W7-1,1a,2P,2bP,3P,3aP,3bP
		2C.17	Truck Escape Ramp	W7-4,4b,4c,4dP,4eP,4fP
		2C.18	Hill Blocks View	W7-6TP
	Cross Section	2C.19	Road Narrows	W5-1
		2C.20,20A,21	Narrow Bridge, Load Zoned Bridge, One Lane Bridge	W5-2,3; W12-5T
		2C.22,23,25	Divided Highway, Divided Highway Ends, Double Arrow	W6-1,1aT,2, 2aT; W12-1
		2C.24	Freeway Ends, All Traffic Must Exit	W19-1,3,5
		2C.26	Dead End, No Outlet, Road Ends	W14-1,1a,1T,2,2a
		2C.27	Low Clearance	W12-2, 2TP,2a, 3TP; W13-4aTP
		2C.28,29	Bump, Dip, Speed Hump	W8-1,2; W17-1
	Roadway Surface Condition	2C.30	Pavement Ends	W8-3
		2C.31	Shoulder, Uneven Lanes	W8-4,9, 9aT, 11,17,17P,23,25
		2C.32	Loose Gravel, Loose Sand,Rough Road, Watch for Ice on Bridge, Watch for Mud on Road, Fallen Rocks, Rock Slides, Earth Slides	W8-,7, 7aT,8, 13T, 14 ; W17-11T,12T,15T
		2C.33	Grooved Pavement, Metal Bridge Deck	W8-15,15P,16
		2C.34	No Center Line	W8-12
		2C.35	Water Crossing, When Flooded Turn Around Dont Drown,Road May Flood, Flood Gauge, Gusty Winds Area, Fog Area , Watch for Smoke on the Road,	W8-18, 18aT, 18bT, 19,21,22 ;W17-14T
	Weather	2C.36-39	Stop Ahead, Yield Ahead, Signal Ahead, Be Prepared To Stop, Speed Reduction, Drawbridge Ahead, Ramp Meter Ahead	W3-1,2,3,4,5,6,7,8
		2C.40-45	Merge, No Merge Area, Lane Ends, Added Lane, Two-Way Traffic, Two Way Traffic on Three Lane Road, Thru Traffic Merge Right, No Passing Zone	W4-1,1aT, 2,3,5,5P,6; W6-3;3aT W9-1,2; W14-3
2C.46 ,46A, 46B		Cross Road, Side Road, T, Y, Circular Intersection, Side Roads, Highway Intersection Ahead, Traffic Island Ahead	W2-1,1aT,2,3,4,5,6, 6aT, 7,8; W16-12P,17P	
2C.47		Large Arrow (two directions),Chevron/Two Direction Large Arrow	W1-7,7T	
2C.48		Oncoming Extended Green	W25-1,2	
2C.49		Truck Crossing, Truck (symbol), Emergency Vehicle, Watch for Emergency Vehicles, Tractor, Bicycle, Golf Cart, Horse-Drawn Vehicle, Trail Crossing	W8-6; W11-1,12T, 5,5a,8,10, 11,12P,1-4,15,15P,15a; W16-13P	
2C.50,51		Pedestrian, Deer, Cattle, Snowmobile, Equestrian, Wheelchair, Large Animals, Playground	W11-2,3,4,6,7,9,16,17,18,19, 20,21,22; W15-1; W16-13P	
Traffic Related	New	2C.52	New Traffic Pattern Ahead	W23-2
	Location	2C.53	Downward Diagonal Arrow, Ahead	W16-7P,9P
	HOV	2C.53	High-Occupancy Vehicle	W16-11P
	Distance	2C.55	XX Feet, XX Miles, Next XX Feet, Next XX Miles	W7-3aP; W16-2P,2aP,3P,3aP,4P
	Arrow	2C.56	Advance Arrow, Directional Arrow	W16-5P,6P
	Street Name Plaque	2C.58	Advance Street Name	W16-8P,8aP
	Intersection	2C.59	Cross Traffic Does Not Stop	W4-4P,4aP,4bP
	Share The Road	2C.60	Share The Road	W16-1P
	Photo Enforced	2C.61	Photo Enforced	W16-10aP
	New	2C.62	New	W16-15P
Other Supplemental Plaques	2C.53	Downward Diagonal Arrow, Ahead	W16-7P,9P	
	2C.53	High-Occupancy Vehicle	W16-11P	
	2C.55	XX Feet, XX Miles, Next XX Feet, Next XX Miles	W7-3aP; W16-2P,2aP,3P,3aP,4P	
	2C.56	Advance Arrow, Directional Arrow	W16-5P,6P	
	2C.58	Advance Street Name	W16-8P,8aP	
	2C.59	Cross Traffic Does Not Stop	W4-4P,4aP,4bP	
	2C.60	Share The Road	W16-1P	
	2C.61	Photo Enforced	W16-10aP	

Table 2C-2. Warning Sign and Plaque Sizes (Sheet 1 of 3)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	** Multi-Lane				
Horizontal Alignment	W1-1,2,3,4,5	2C.07	30 x 30*	36 x 36	36 x 36	36 x 36	—	48 x 48
Combination Horizontal Alignment/Advisory Speed	W1-1a,2a	2C.10	36 x 36	36 x 36	48 x 48	48 x 48	—	48 x 48
One-Direction Large Arrow	W1-6	2C.12	48 x 24	48 x 24	60 x 30	60 x 30	—	60 x 30
Two-Direction Large Arrow	W1-7	2C.47	48 x 24	48 x 24	—	—	—	60 x 30
Chevron/Two-Direction Large Arrow	W1-7T	2C.47	96 x 36	96 x 36	144 x 36	144 x 36	—	—
Chevron Alignment	W1-8	2C.09	18 x 24	18 x 24	30 x 36	36 x 48	—	24 x 30
Chevron/One Direction Large Arrow	W1-9T	2C.12	96 x 36	96 x 36	144 x 36	144 x 36	—	—
Combination Horizontal Alignment/Intersection	W1-10,10a,10b,10c,10d,10e	2C.11	36 x 36	36 x 36	36 x 36	48 x 48	—	—
Hairpin Curve	W1-11	2C.07	30 x 30	30 x 30	36 x 36	48 x 48	—	48 x 48
Curve Blocks View	W1-11T	2C.07	30 x 30*	36 x 36	36 x 36	48 x 48	—	48 x 48
Curve Blocks View	W1-11TP	2C.07	24 x 18	24 x 18	24 x 18	—	—	—
Truck Rollover	W1-13	2C.13	36 x 36	36 x 36	36 x 36	48 x 48	—	36 x 36
270-degree Loop	W1-15	2C.07	30 x 30	30 x 30	36 x 36	48 x 48	—	48 x 48
Intersection Warning	W2-1,2,3,4,5,6,7,8	2C.46	30 x 30	30 x 30	36 x 36	—	24 x 24	48 x 48
Highway Intersection Ahead	W2-1aT	2C.46A	48 x 48	48 x 48	48 x 48	—	—	—
Traffic Island Ahead	W2-6aT	2C.46B	36 x 36	36 x 36	—	—	—	—
Stop, Yield, or Signal Ahead	W3-1,2,3	2C.36	30 x 30	30 x 30	48 x 48	48 x 48	30 x 30	—
Be Prepared to Stop	W3-4	2C.36	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30	—
Reduced Speed Limit Ahead	W3-5	2C.38	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Draw Bridge	W3-6	2C.39	36 x 36	36 x 36	48 x 48	—	—	60 x 60
Ramp Meter Ahead	W3-7	2C.37	36 x 36	36 x 36	—	—	—	—
Ramp Metered When Flashing	W3-8	2C.37	36 x 36	36 x 36	—	—	—	—
Merging Traffic	W4-1	2C.40	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Thru Traffic Merge Right	W4-1aT	2C.40	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Lane Ends	W4-2	2C.42	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Added Lane	W4-3	2C.41	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Cross Traffic Does Not Stop (plaque)	W4-4P	2C.59	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Traffic From Left (Right) Does Not Stop (plaque)	W4-4aP	2C.59	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Oncoming Traffic Does Not Stop (plaque)	W4-4bP	2C.59	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Entering Roadway Merge	W4-5	2C.40	36 x 36	36 x 36	48 x 48	—	—	—
No Merge Area (plaque)	W4-5P	2C.40	18 x 24	18 x 24	24 x 30	—	—	—
Entering Roadway Added Lane	W4-6	2C.41	36 x 36	36 x 36	48 x 48	—	—	—
Road Narrows	W5-1	2C.19	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Narrow Bridge	W5-2	2C.20	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
One Lane Bridge	W5-3	2C.21	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Divided Highway	W6-1	2C.22	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Divided Highway	W6-1aT	2C.22	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Divided Highway Ends	W6-2	2C.23	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Divided Highway Ends	W6-2aT	2C.23	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Two-Way Traffic	W6-3	2C.44	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Two Way Traffic on a Three Lane Road	W6-3aT	2C.44A	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Hill	W7-1	2C.16	30 x 30*	36 x 36	36 x 36	36 x 36	24 x 24*	48 x 48
Hill with Grade	W7-1a	2C.16	30 x 30*	36 x 36	36 x 36	36 x 36	24 x 24*	48 x 48
Use Low Gear (plaque)	W7-2P	2C.57	24 x 18	24 x 18	—	—	—	—
Trucks Use Lower Gear (plaque)	W7-2bP	2C.57	24 x 18	24 x 18	—	—	—	—
XX% Grade (plaque)	W7-3P	2C.57	24 x 18	24 x 18	—	—	—	—
Next XX Miles (plaque)	W7-3aP	2C.55	24 x 18	24 x 18	—	—	—	—

* The minimum size required for diamond-shaped warning signs facing traffic on multi-lane conventional roads shall be 36 x 36 per Section 2C.04.
 ** The minimum size for diamond-shaped warning signs on state-maintained conventional roads should be 36" x 36". All other signs and plaques on state-maintained conventional roadways should use the multi-lane size as a standard.

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

Table 2C-2. Warning Sign and Plaque Sizes (Sheet 2 of 3)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	** Multi-Lane				
XX% Grade, XX Miles (plaque)	W7-3bP	2C.57	24 x 18	24 x 18	—	—	—	—
Runaway Truck Ramp XX Miles	W7-4	2C.17	78 x 48	78 x 48	78 x 48	78 x 48	—	—
Runaway Truck Ramp (with arrow)	W7-4b	2C.17	78 x 60	78 x 60	78 x 60	78 x 60	—	—
Truck Escape Ramp	W7-4c	2C.17	78 x 60	78 x 60	78 x 60	78 x 60	—	—
Sand, Gravel, Paved (plaques)	W7-4dP, 4eP,4fP	2C.17	24 x 12	24 x 12	24 x 12	24 x 12	—	—
Hill Blocks View	W7-6	2C.18	30 x 30*	36 x 36	36 x 36	—	—	48 x 48
Hill Blocks View (plaque)	W7-6TP	2C.07	24 x 18	24 x 18	24 x 18	—	—	—
Bump or Dip	W8-1,2	2C.28	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Pavement Ends	W8-3	2C.30	36 x 36	36 x 36	48 x 48	—	30 x 30*	—
Soft Shoulder	W8-4	2C.31	36 x 36	36 x 36	48 x 48	48 x 48	24 x 24*	48 x 48
Slow Down on Wet Road	W8-5aT	2C.32	30 x 30	36 x 36	36 x 36	48 x 48	—	48 x 48
Road Condition (plaques)	W8-5P,5bP,5cP	2C.32	24 x 18	24 x 18	30 x 24	36 x 30	—	36 x 30
Ice	W8-5aP	2C.32	24 x 12	24 x 12	30 x 18	30 x 18	—	—
Truck Crossing	W8-6	2C.49	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Loose Gravel	W8-7	2C.32	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Loose Sand	W8-7aT	2C.32	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24	48 x 48
Rough Road	W8-8	2C.32	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Low Shoulder	W8-9	2C.31	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Shoulder Drop Off	W8-9aT	2C.31	30 x 30*	36 x 36	48 x 48	48 x 48	24 x 24	48 x 48
Uneven Lanes	W8-11	2C.32	36 x 36	36 x 36	36 x 36	48 x 48	—	48 x 48
No Center Line	W8-12	2C.34	36 x 36	36 x 36	36 x 36	48 x 48	—	—
Bridge May Ice in Cold Weather	W8-13aT	2C.32	36 x 36	36 x 36	36 x 36	48 x 48	—	48 x 48
Fallen Rocks	W8-14	2C.32	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Grooved Pavement	W8-15	2C.33	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Motorcycle (plaque)	W8-15P	2C.33	24 x 18	24 x 18	30 x 24	36 x 30	—	36 x 30
Metal Bridge Deck	W8-16	2C.33	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Shoulder Drop Off (symbol)	W8-17	2C.31	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Shoulder Drop-Off (plaque)	W8-17P	2C.31	24 x 18	24 x 18	30 x 24	36 x 30	—	36 x 30
Road May Flood	W8-18	2C.35	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Water Crossing	W8-18aT	2C.35	36 x 36	36 x 36	36 x 36	48 x 48	—	48 x 48
When Flooded Turn Around Don't Drown	W8-18bT	2C.35	48 x 48	48 x 48	48 x 48	48 x 48	—	48 x 48
Flood Gauge	W8-19	2C.35	12 x 72	12 x 72	—	—	—	—
Flood Gauge (Plaque)	W8-19aTP	2C.35	18x12	18x12	—	—	—	—
Gusty Winds Area	W8-21	2C.35	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Fog Area	W8-22	2C.35	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
No Shoulder	W8-23	2C.31	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Shoulder Ends	W8-25	2C.31	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Left (Right) Lane Ends	W9-1	2C.42	36 x 36	36 x 36	36 x 36	48 x 48	30 x 30*	48 x 48
Lane Ends Merge Left (Right)	W9-2T	2C.42	36 x 36	36 x 36	36 x 36	48 x 48	30 x 30*	48 x 48
Bicycle	W11-1	2C.49	30 x 30	30 x 30	36 x 36	—	24 x 24*	48 x 48
Pedestrian	W11-2	2C.50	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Large Animals	W11-3,4,16,17,18,19,20,21,22	2C.50	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Farm Vehicle	W11-5,5a	2C.49	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Snowmobile	W11-6	2C.50	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Equestrian	W11-7	2C.50	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Emergency Vehicle	W11-8	2C.49	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Handicapped	W11-9	2C.50	30 x 30*	36 x 36	36 x 36	—	—	48 x 48
Truck	W11-10	2C.49	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Golf Cart	W11-11	2C.49	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Watch for Emergency Vehicles	W11-12T	2C.49	36 x 36	36 x 36	36 x 36	—	—	—

* The minimum size required for diamond-shaped warning signs facing traffic on multi-lane conventional roads shall be 36 x 36 per Section 2C.04.

** The minimum size for diamond-shaped warning signs on state-maintained conventional roads should be 36" x 36". All other signs and plaques on state-maintained conventional roadways should use the multi-lane size as a standard.

Notes: 1. Larger signs may be used when appropriate.

2. Dimensions in inches are shown as width x height.

Figure 2C-6. Roadway and Weather Condition and Advance Traffic Control Signs and Plaques (1 of 2)

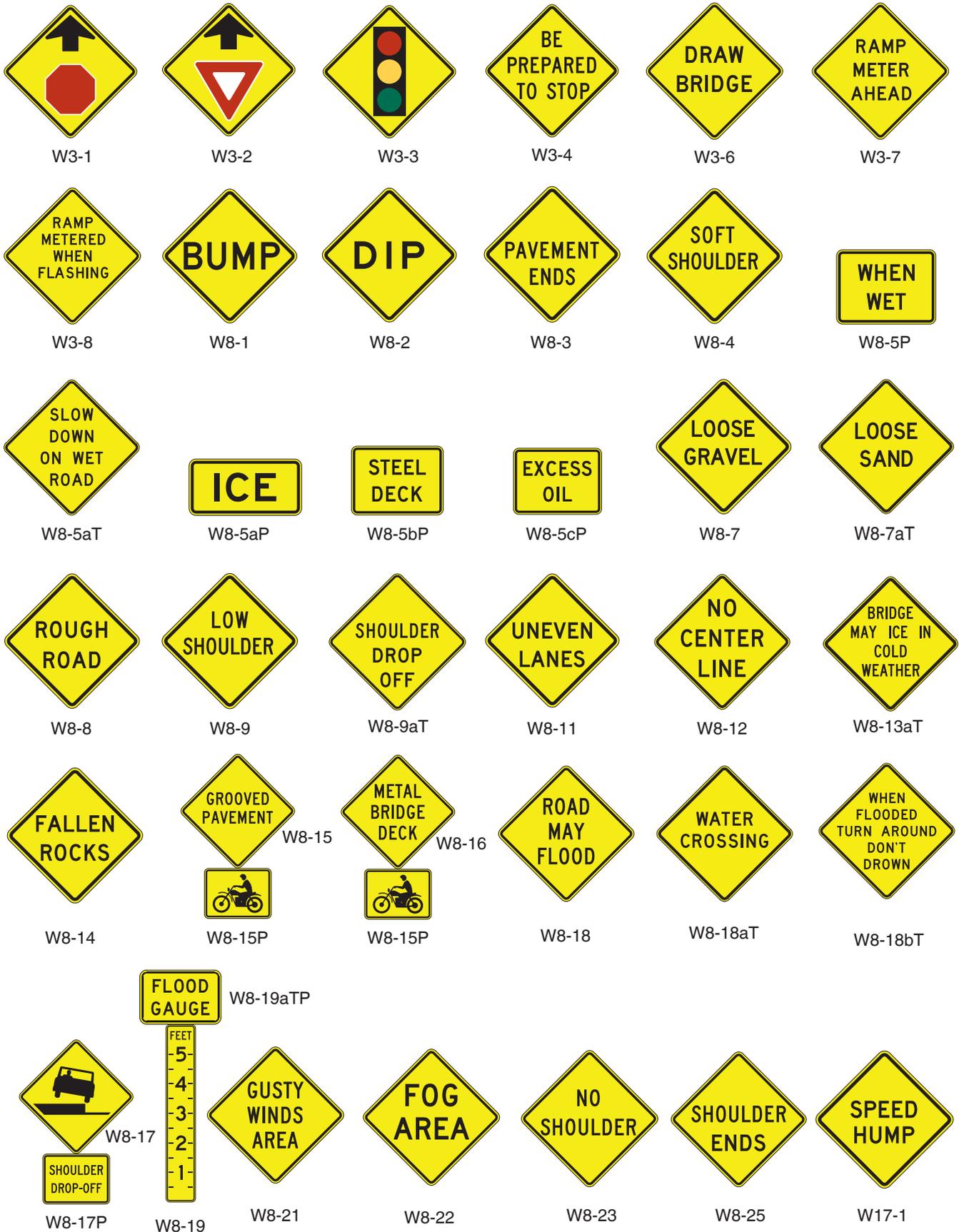


Figure 2C-6. Roadway and Weather Condition and Advance Traffic Control Signs and Plaques (2 of 2)



05 The NO SHOULDER (W8-23) sign (see Figure 2C-6) may be used to warn road users that a shoulder does not exist along a portion of the roadway.

06 The SHOULDER ENDS (W8-25) sign (see Figure 2C-6) may be used to warn road users that a shoulder is ending.

Standard:

07 **When used, shoulder signs shall be placed in advance of the condition (see Table 2C-4).**

Guidance:

08 *Additional shoulder signs should be placed at appropriate intervals along the road where the condition continually exists.*

Section 2C.32 Surface Condition Signs (W8-5aT, W8-7, W8-7aT, W8-8, W8-11, W8-13aT, W8-14, W17-11T, W17-12T, and W17-15T)

Option:

01 The SLOW DOWN ON WET ROAD (W8-5aT) sign (see Figure 2C-6) may be used to warn of unexpected slippery conditions.

02 The LOOSE GRAVEL (W8-7) sign (see Figure 2C-6) may be used to warn of loose gravel on the roadway surface.

03 The LOOSE SAND (W8-7aT) sign (see Figure 2C-6) may be used to warn of a location where wind drifted sand may occasionally be encountered on the roadway or where blowing sand is a frequent hazard for drivers. It may also be used at locations where drivers parking off the shoulder of the highway, road, or street would probably encounter loose sand.

04 The WATCH FOR MUD ON ROAD (W17-15T) sign (see Figure 2C-6) may be used to warn of locations where mud may be on the roadway surface. The sign message may be modified to WATCH FOR DEBRIS ON ROAD.

05 The ROUGH ROAD (W8-8) sign (see Figure 2C-6) may be used to warn of a rough roadway surface.

06 An UNEVEN LANES (W8-11) sign (see Figure 2C-6) may be used to warn of a difference in elevation between travel lanes.

07 The BRIDGE MAY ICE IN COLD WEATHER (W8-13aT) sign (see Figure 2C-6) may be used in advance of bridges to advise bridge users of winter weather conditions. The BRIDGE MAY ICE IN COLD WEATHER sign may be removed or covered during seasons of the year when its message is not relevant.

08 The FALLEN ROCKS (W8-14) sign (see Figure 2C-6) may be used in advance of an area that is adjacent to a hillside, mountain, or cliff where rocks frequently fall onto the roadway.

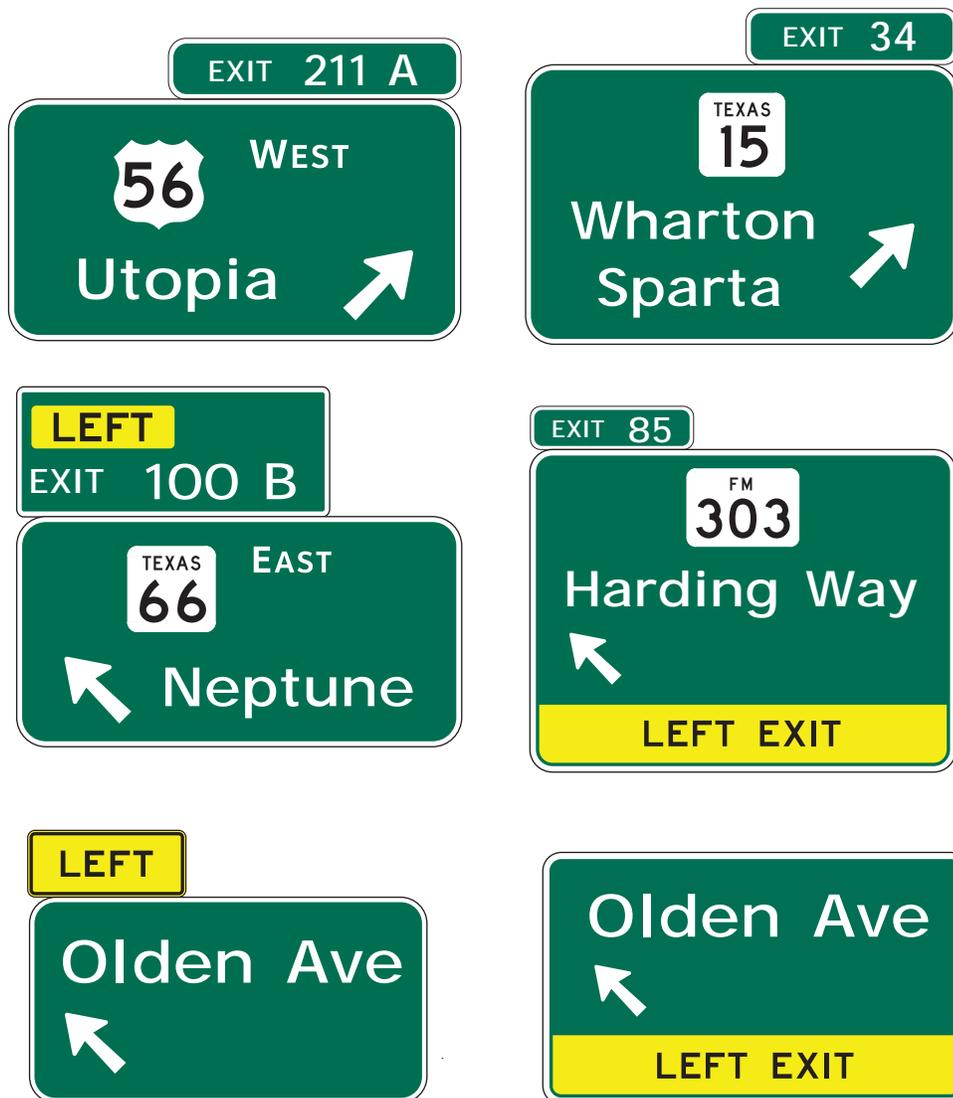
09 ROCK SLIDES (W17-11T) or EARTH SLIDES (W17-12T) signs (see Figure 2C-6), whichever is appropriate, may be used at a rock or earth cuts to warn that sliding rock or earth may be encountered.

Guidance:

10 *The ROCK SLIDES and EARTH SLIDES signs should be erected only after a study has been made to determine the need for its use.*

11 *When used, Surface Condition signs should be placed in advance of the beginning of the affected section (see Table 2C-4), and additional signs should be placed at appropriate intervals along the road where the condition exists.*

Figure 2E-26. Examples of Interchange Exit Direction Signs



be located near, but not downstream from, the point where the outside edge of the dropped lane begins to diverge from the mainline (see Figures 2E-2B, 2E-2C, 2E-4 through 2E-6).

- 07 The following provisions shall govern the design and application of overhead Exit Direction signs:
- A. The sign shall carry the exit number (if exit numbering is used), the route number, cardinal direction, and destination, as applicable, with a diagonally upward-pointing directional arrow (see Figure 2E-26).
 - B. The message EXIT ONLY in black on a yellow sign panel (E11-1T or E11-1gT) shall be used on the overhead Exit Direction sign to advise road users of a lane drop situation (see Figures 2E-8 through 2E-11). The sign shall comply with the provisions of Section 2E.24.

Guidance:

- 08 For numbered exits to the right, an exit number (E1-5P) plaque (see Figure 2E-22) should be added to the top right-hand edge of the sign.

Standard:

- 09 For numbered exits to the left, a left exit number (E1-5bP) plaque or an exit number (E1-5P) plaque (see Figure 2E-22) shall be added to the top left-hand edge of the sign. If an E1-5P plaque is used, a Left Exit panel (E11-2aT) shall be used at the bottom of the sign (see figure 2E-26).
- 10 For non-numbered exits to the left, a LEFT (E1-5aP) plaque (see Figure 2E-22) shall be added to the top left-hand edge of the sign or a LEFT EXIT (E11-2aT) panel (see Figure 2E-13) shall be used on the bottom of the sign.

Support:

- 11 Section 2E.31 contains additional information regarding exit numbering.

Option:

- 12 In some cases, principally in urban areas, where restricted sight distance because of structures or unusual alignment make it impossible to locate the Exit Direction sign without violating the required minimum spacing (see Section 2E.33) between major guide signs, Interchange Sequence signs (see Section 2E.40) may be substituted for an Advance Guide sign.

Guidance:

- 13 *At multi-exit interchanges, the Exit Direction sign should be located directly over the exiting lane for the first exit. At the same location, and normally over the right-hand through lane, an Advance Guide sign for the second exit should be located. Only for those conditions where the through movement is not evident should a confirmatory message (Pull-Through sign as shown in Figure 2E-2) be used over the left lane(s) to guide road users traveling through an interchange. In the interest of sign spreading, three signs on one structure should not be used. When the freeway or expressway is on an overpass, the Exit Direction sign should be installed on an overhead support over the exit lane in advance of the gore point.*

Option:

- 14 If the second exit is beyond an underpass, the Exit Direction sign may be mounted on the face of the overhead structure.
- 15 Where extra emphasis of an especially low advisory ramp speed is needed, an EXIT XX MPH (E13-2) sign panel (see Figure 2E-27) may be placed at the bottom of the Exit Direction sign to supplement, but not to replace, the exit or ramp advisory speed warning signs.

Guidance:

- 16 *At the last exit from a highway before it becomes a facility on which toll payments are required, the LAST FREE EXIT (W90-5TP) plaque (see Section 2F.10 and Figure 2F-3) should be installed above the Exit Direction sign.*

Option:

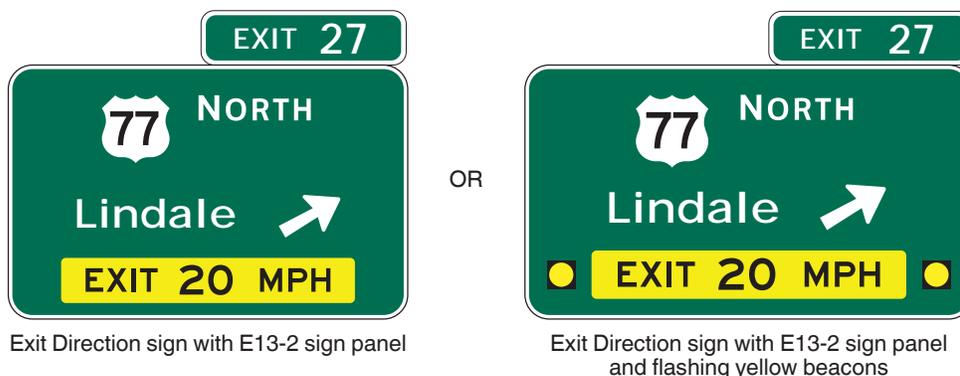
- 17 If there is insufficient space above the Exit Direction sign because of the presence of an Exit Number (E1-5P) plaque, the W90-5TP plaque may be mounted below the Exit Direction sign.

Section 2E.37 Exit Gore Signs (E5-1 Series)**Support:**

- 01 The Exit Gore (E5-1 or E5-1a) sign (see Figure 2E-28) in the gore indicates the exiting point or the place of departure from the main roadway. Consistent application of this sign at each exit is important.

Standard:

- 02 **The gore shall be defined as the area located between the main roadway and the ramp just beyond where the ramp branches from the main roadway. The Exit Gore sign shall be located in the gore and shall carry the word EXIT or EXIT XX (if interchange numbering is used) and an appropriate upward slanting arrow. If suffix letters are used for exit numbering at a multi-exit interchange, the suffix letter shall also be included on the Exit Gore sign and shall be separated from the exit number by a space having a width of**

Figure 2E-27. Interchange Exit Direction Sign with an Advisory Speed Panel

between 1/2 and 3/4 of the height of the suffix letter. Breakaway or yielding supports shall be used.

Guidance:

- 03 The arrow should be aligned to approximate the angle of departure. Each gore should be treated similarly, whether the interchange has one exit roadway or multiple exits.

Option:

- 04 Where extra emphasis of an especially low advisory ramp speed is needed, an E13-1P plaque indicating the advisory speed may be mounted below the Exit Gore sign (see Figure 2E-28) to supplement, but not to replace, the exit or ramp advisory speed warning signs.
- 05 To improve the visibility of the gore for exiting drivers, a Type 1 object marker (see Chapter 2C) may be installed on each sign support below the Exit Gore sign.

- 06 An Exit Number (E5-1bP) plaque (see Figure 2E-22) may be installed above an existing Exit Gore (E5-1) sign when a non-numbered exit is converted to a numbered exit.

Standard:

- 07 An Exit Gore (E5-1a) sign shall be used when the replacement of an existing assembly of an E5-1 sign and an E5-1bP plaque becomes necessary.

Option:

- 08 The Narrow Exit Gore (E5-1c) sign may be used in gore areas of limited width where the width of the Exit Gore (E5-1a) sign would not permit sufficient lateral offset (see Section 2A.19), such as for ramp departures that are nearly parallel to the mainline roadway where the Exit Gore sign would be mounted on a narrow island or barrier. Where the E5-1c sign is mounted at a height of 14 feet or more from the roadway, the directional arrow may point diagonally downward.

Guidance:

- 09 The E5-1c should not be used in gore areas where an E5-1a sign could be installed with sufficient lateral offset.

Section 2E.38 Post-Interchange Signs

Guidance:

- 01 If space between interchanges permits, as in rural areas, and where undue repetition of messages will not occur, a fixed sequence of signs should be displayed beginning 500 feet beyond the downstream end of the acceleration lane. At this point a Route sign assembly should be installed followed by a Speed Limit sign and a Distance sign, each at a spacing of 1,000 feet.

- 02 If space between interchanges does not permit placement of these three post-interchange signs without encroaching on or overlapping the Advance Guide signs necessary for the next interchange, or in rural areas where the interchanging traffic is primarily local, one or more of the post-interchange signs should be omitted.

Option:

- 03 Usually the Distance sign will be of less importance than the other two signs and may be omitted, especially if Interchange Sequence signs are used. If the sign for through traffic on an overhead assembly already contains the route sign, the post-interchange route sign assembly may also be omitted.

Section 2E.39 Post-Interchange Distance Signs

Standard:

- 01 If used, the Post-Interchange Distance sign shall consist of a two- or three-line sign carrying the names of significant destination points and the distances to those points. The top line of the sign shall identify the



next meaningful interchange with the name of the community near or through which the route passes, or if there is no community, the route number or name of the intersected highway (see Figure 2E-29).

Support:

- 02 The minimum sizes of the route shields identifying a significant destination point are prescribed in Tables 2E-4T and 2E-5.

Option:

- 03 The text identification of a route may be displayed instead of a route shield, such as “US XX,” “State Route XX,” or “County Route XX.”

Guidance:

- 04 *If a second line is used, it should be reserved for communities of general interest that are located on or immediately adjacent to the route or for major traffic generators along the route.*

Option:

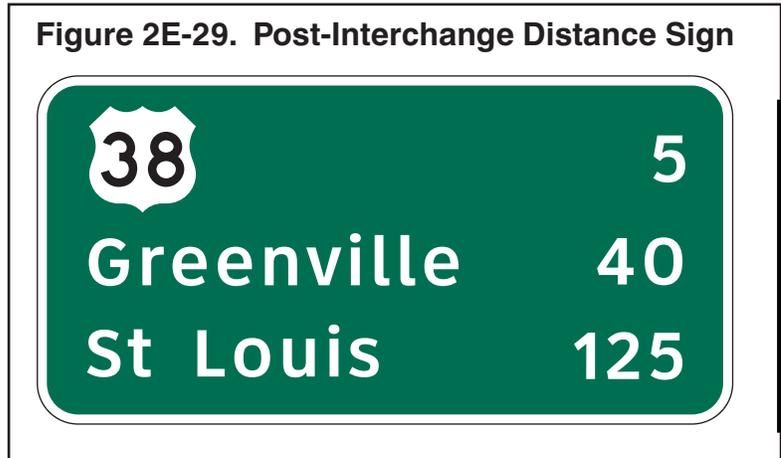
- 05 The choice of names for the second line, if it is used, may be varied on successive Distance signs to give road users maximum information concerning communities served by the route.

Standard:

- 06 **The third, or bottom line, shall contain the name and distance to a control city (if any) that has national significance for travelers using the route.**

Guidance:

- 07 *Distances to the same destinations should not be shown more frequently than at 5-mile intervals. The distances displayed on these signs should be the actual distance to the destination points and not to the exit from the freeway or expressway. The distance displayed for each community should comply with the provisions of Section 2D.41.*



Section 2E.40 Interchange Sequence Signs

Option:

- 01 If interchanges are closely spaced, particularly through large urban areas, so that guide signs cannot be adequately spaced, Interchange Sequence signs identifying the next two or three interchanges may be used.

Guidance:

- 02 *If used, Interchange Sequence signs should be used over the entire length of a route in an urban area. Except as provided in Paragraph 3, they should not be used on a single interchange basis.*

- 03 *If there is less than 800 feet between interchanges, Interchange Sequence signs should be used instead of the Advance Guide signs for the affected interchanges.*

Support:

- 04 Interchange Sequence signs are generally supplemental to Advance Guide signs. Signing of this type is illustrated in Figures 2E-30 and 2E-31, and is compatible with the sign spreading concept described in Paragraph 3 of Section 2E.11.

- 05 These signs are installed in a series and display the next two or three interchanges by name or route number with distances to the nearest 1/4 mile.

Standard:

- 06 **If used, the first sign in the series shall be located in advance of the first Advance Guide sign for the first interchange.**

- 07 **Where the exit direction is to the left, a LEFT (E11-2) sign panel (see Figure 2E-13) shall be displayed on the same line immediately to the right of the interchange name or route number.**

- 08 **Interchange Sequence signs shall not be substituted for Exit Direction signs.**

Guidance:

- 09 *Interchange Sequence signs should be located in the median. After the first of the series, Interchange Sequence signs should be placed approximately midway between interchanges.*

CHAPTER 2F. TOLL ROAD SIGNS

Section 2F.01 Scope

Support:

- 01 Toll highways are typically limited-access freeway or expressway facilities. A portion of or an entire route might be a toll highway, or a bridge, tunnel, or other crossing point might be the only toll portion of a highway. A toll highway might be a conventional road. The general signing requirements for toll roads will depend on the type of facility and access (freeway, expressway, or conventional road). The provisions of Chapters 2D and 2E will generally apply for guide signs along the toll facility that direct road users within and off the facility where exit points and geometric configurations are not dependent specifically on the collection of tolls. The aspect of tolling and the presence of toll plazas or collection points necessitate additional considerations in the typical signing needs. The notification of the collection of tolls in advance of and at entry points to the toll highway also necessitate additional modifications to the typical signing.
- 02 The scope of this Chapter applies to a route or facility on which all lanes are tolled. Chapter 2G contains provisions for the signing of managed lanes within an otherwise non-toll facility that employ tolling or pricing as an operational strategy to manage congestion levels.

Standard:

- 03 Except where specifically provided in this Chapter, the provisions of other Chapters in Part 2 shall apply to toll roads.

Section 2F.02 Sizes of Toll Road Signs

Standard:

- 01 Except as provided in Section 2A.11, the sizes of toll road signs that have standardized designs shall be as shown in Table 2F-1.

Support:

- 02 Section 2A.11 contains information regarding the applicability of the various columns in Table 2F-1.

Option:

- 03 Signs larger than those shown in Table 2F-1 may be used (see Section 2A.11).

Table 2F-1. Toll Road Sign and Plaque Minimum Sizes

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	Multi-Lane				
Toll Rate	R3-28	2F.05	—	—	114 x 48	114 x 48	—	—
Pay Toll (plaque)	R3-29P	2F.05	—	—	24 x 18	24 x 18	—	—
Take Ticket (plaque)	R3-30P	2F.05	—	—	24 x 18	24 x 18	—	—
Pay Toll XX Miles Cars (price)	W9-6	2F.06	96 x 66	96 x 66	96 x 66	96 x 66	—	—
Pay Toll XX Miles Cars (price) (plaque)	W9-6P	2F.07	288* x 36	288* x 36	288* x 36	288* x 36	—	—
Stop Ahead Pay Toll Cars (price)	W9-6a	2F.08	114 x 66	114 x 66	114 x 66	114 x 66	—	—
Stop Ahead Pay Toll (plaque)	W9-6aP	2F.09	252* x 36	252* x 36	252* x 36	252* x 36	—	—
Last Free Exit	W90-5TP	2F.10	—	—	—	Varies x 24	—	—
Free Exit	W90-6TP	2F.10	—	—	—	Varies x 24	—	—
Toll	M4-15	2F.11	24 x 12	24 x 12	36 x 18	36 x 18	24 x 12	36 x 18
No Cash	M4-16	2F.12	24 x 12	24 x 12	36 x 18	36 x 18	24 x 12	36 x 18
Toll Collector Symbol	M4-17	2F.13	—	—	48 x 48	48 x 48	—	—
Exact Change Symbol	M4-18	2F.13	—	—	48 x 48	48 x 48	—	—
ETC Only	M4-20	2F.12	24 x 24	24 x 24	36 x 36	36 x 36	24 x 24	36 x 36

* The width shown represents the minimum dimension. The width shall be increased as appropriate to match the width of the guide sign.

Notes: 1. Larger signs may be used when appropriate

2. Dimensions in inches are shown as width x height

Section 2F.03 Use of Purple Backgrounds and Underlay Panels with ETC Account Pictographs

Standard:

- 01 Use of the color purple on any sign shall comply with the provisions of Sections 1A.12 and 2A.10. Except as provided in Sections 2F.12 and 2F.16, purple as a background color shall be used only when the information associated with the appropriate ETC account is displayed on that portion of the sign. The background color of the remaining portion of such signs shall comply with the provisions of Sections 1A.12 and 2A.10 as appropriate for a regulatory, warning, or guide sign. Purple shall not be used as a background color to display a destination, action message, or other legend that is not a display of the requirement for all vehicles to have a registered ETC account.
- 02 If a video billing system (such as “Pay by Mail” (R91-2TP)) is used in conjunction with an ETC payment system (such as TxTAG (R91-1TP)), a purple background or underlay panel shall not be used with the ETC pictograph (see Figure 2F-1TA).
- 03 If only vehicles with registered ETC accounts are allowed to use a highway lane, a toll plaza lane, an open-road tolling lane, or all lanes of a toll highway or connection, the signs for such lanes or highways shall incorporate the pictograph (see Chapter 2A) adopted by the toll facility’s ETC payment system and the regulatory message ONLY. Except for ETC pictographs whose predominant background color is purple, if incorporated within the green background of a guide sign, the ETC pictograph shall be on a white rectangular or square panel set on a purple underlay panel with a white border. For rectangular ETC pictographs whose predominant background color is purple, a white border shall be used at the outer edges of the purple rectangle to provide contrast between the pictograph and the sign background color.
- 04 If an ETC pictograph is used on a separate plaque with a guide sign or on a header panel within a guide sign, the plaque or the header panel shall have a purple background with a white border and the ETC pictograph shall have a white border to provide contrast between the pictograph and the background of the plaque or header panel.
- 05 Purple underlay panels for ETC pictographs or purple backgrounds for plaques and header panels shall only be used in the manner described in Paragraphs 1 through 4 to convey the requirement of a registered ETC account on signs for lanes reserved exclusively for vehicles with such an account and on directional signs to an ETC account-only facility from a non-toll facility or from a toll facility that accepts multiple payment forms.

Support:

- 06 Figure 2F-1 shows examples of ETC account pictographs, their use with various background colors, and modifications involving underlay panels.
- 07 Section 2F.04 contains provisions regarding the size of pictographs for ETC accounts.

Section 2F.04 Size of ETC Pictographs

Standard:

- 01 The ETC pictograph (see Chapter 2A) shall be of a size that makes it a prominent feature of the sign legend as necessary for conspicuity for those road users with registered ETC accounts seeking such direction, as well as for those road users who do not have ETC accounts so that it is clear to them to avoid such direction when applicable.

Guidance:

- 02 *An ETC pictograph that is in the shape of a horizontal rectangle should have a minimum height between approximately 1.5 and 2 times the upper-case letter height of the principal legend on the sign. The width of an ETC pictograph in the shape of a horizontal rectangle should be between approximately two and three times the height of the pictograph. When the pictograph is the principal legend on the sign, such as for advance guide signs for open-road tolling lanes (see Section 2F.15), the minimum height of a horizontal rectangular ETC pictograph should be consistent with that of a route shield prescribed for the particular application and type of sign.*
- 03 *For ETC pictographs whose shape is square, circular, or otherwise similar in height and width, or is a vertical rectangle, the same basic principles for conspicuity and placement should be followed. ETC pictographs whose shape is not in that of a horizontal rectangle should be suitably sized to facilitate conspicuity as described in Paragraph 1 and should be of a similar approximate area as the horizontal rectangular pictographs designed in accordance with the height and width as provided in Paragraph 2.*

Section 2F.05 Regulatory Signs for Toll Plazas

Support:

- 01 Toll plaza operations often include lane-specific restrictions on vehicle type, forms of payment accepted, and speed limits or required stops. Vehicles are typically required to come to a stop to pay the toll or receive a toll

Guidance:

- 06 *If used, the Pay Toll Cash (E90-8T) sign should be installed downstream from the Advance Toll Plaza (E90-10T) sign where some or all of the lanes are required to come to a stop to pay a toll (see Figure 2F-3). The location of the signs should coincide with the approximate location where the mainline lanes begin to widen on the approach to the toll plaza lanes.*

Standard:

- 07 **The Pay Toll Cash (E90-8T) sign shall have a black legend and border on a white background. See “Standard Highway Sign Designs for Texas” book for design details.**

Section 2F.09 Stop Ahead Pay Toll Warning Plaque (W9-6aP)**Option:**

- 01 The Stop Ahead Pay Toll (W9-6aP) plaque (see Figure 2F-3) may be installed above the appropriate guide sign at the location specified for the Stop Ahead Pay Toll (W9-6a) sign (see Section 2F.08) if there is insufficient space for the W9-6a sign at that location.

Standard:

- 02 **The W9-6aP plaque shall be a horizontal rectangle with black legend and border on a yellow background. The legend shall include STOP AHEAD PAY TOLL and, except for toll-ticket facilities, the toll for passenger or 2-axle vehicles. Where the toll for passenger or 2-axle vehicles is variable by time of day, a changeable message element shall be incorporated into the W9-6aP plaque to display the toll in effect. For toll plazas where road users entering a toll-ticket facility are issued a toll ticket, the legend PAY TOLL shall be replaced with a suitable legend such as TAKE TICKET.**

Option:

- 03 The toll for passenger or 2-axle vehicles may be omitted from the W9-6aP plaque if the toll information is displayed on the guide sign that the plaque accompanies.

Section 2F.10 LAST FREE EXIT (W90-5TP) and FREE EXIT (W90-6TP) Warning Plaques**Guidance:**

- 01 *The LAST FREE EXIT (W90-5TP) plaque (see Figure 2F-3) should be used to notify road users of the last exit from a highway before it becomes a facility on which toll payments are required. The plaque should be installed above the appropriate guide signs for the exit (see Sections 2E.33 and 2E.36). If the LAST FREE EXIT plaque is used on roadways with numbered exits, the LAST FREE EXIT plaque should be installed below the Exit Number panel (see Section 2E.31). The FREE EXIT (W90-6TP) plaque (see Figure 2F-3) should be used to notify road users of an exit to a non-tolled roadway.*

Standard:

- 02 **The W90-5TP and W90-6TP plaques shall have a black legend and border on a yellow background.**

Section 2F.10A TOLL Route Signs (M90 Series) and Auxiliary Signs (M3-1 through M3-4 and M6 Series)**Guidance:**

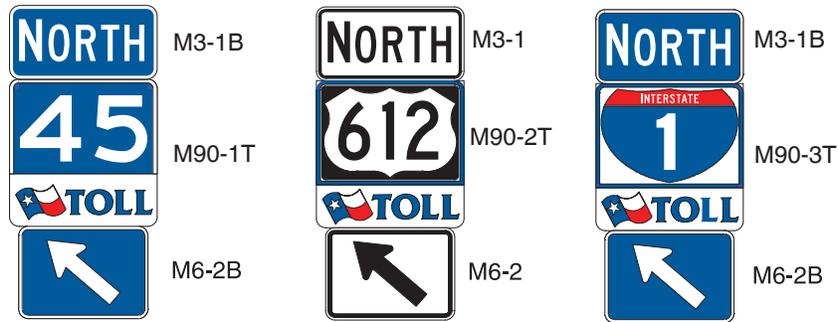
- 01 *Toll route signs should be used on guide signs or sign assemblies as necessary for guidance on toll roads and approaches to toll roads. The toll route sign designs should be as shown in Figure 2F-3TA and detailed in the “Standard Highway Sign Designs for Texas” book (see Section 1A.11).*
- 02 *Cardinal direction auxiliary signs (M3-1 through M3-4) and directional arrow auxiliary signs (M6 series) used for small sign assemblies on US highways should have a black legend and border on a white background. For all other highways, including interstates, auxiliary signs should have a white legend and border on a blue background (see Figure 2F-3TA).*

Standard:

- 03 **A Toll Route Sign shall include the term “TOLL” within the design of the route sign.**

Section 2F.11 TOLL Auxiliary Sign (M4-15)**Standard:**

- 01 **The TOLL (M4-15) auxiliary sign (see Figure 2F-4) shall have a black legend and border on a yellow background and shall be mounted directly above the route sign of a numbered toll highway or, if used, above the cardinal direction and alternative route auxiliary signs, in any route sign assembly providing**

Figure 2F-3TA. Examples of TOLL Route Small Sign Assemblies

directions from a non-toll highway to the toll highway or to a segment of a highway on which the payment of a toll is required **except as noted in the guidance below.**

Guidance:

- 02 The TOLL (M4-15) auxiliary sign should not be mounted above the route sign if the route sign incorporates the term “TOLL” within the design of the route sign see Figure 2F-4).

Section 2F.12 Electronic Toll Collection (ETC) Account-Only Auxiliary Signs (M4-16 and M4-20)

Standard:

- 01 In any route sign assembly providing directions from a non-toll highway to a toll facility, or to a tolled segment of a highway, where electronic toll collection (ETC) is the only payment method accepted and all vehicles are required to have a registered ETC account, the ETC Account-Only (M4-20) auxiliary sign (see Figure 2F-4) shall be mounted directly below the route sign of the numbered or named toll facility. The M4-20 auxiliary sign shall have a white border and purple background and incorporate the pictograph adopted by the toll facility’s ETC payment system and the word ONLY in black letters on a white panel set on the purple background of the sign.

Option:

- 02 The NO CASH (M4-16) auxiliary sign (see Figure 2F-4) with a black legend and border on a white background may be used in a route sign assembly directly below the M4-20 auxiliary sign.

Section 2F.13 Toll Facility and Toll Plaza Guide Signs – General

Support:

- 01 Toll plazas are used on many toll highways, bridges, and tunnels for collection of tolls from road users. Electronic toll collection and/or open-road tolling might also be used on such facilities, either in addition to or in place of collecting toll payments at toll plazas.
- 02 Chapter 2G contains information regarding signs for preferential and managed lanes that are applicable to toll roads.
- 03 Chapter 3E contains information regarding pavement markings for certain toll plaza applications.

Standard:

- 04 **Directional assemblies for entrances to a toll highway or to a road leading directly to a toll highway with no opportunity to exit before paying or being charged a toll, shall clearly indicate that the facility is a toll facility. The TOLL (M4-15) auxiliary sign (see Section 2F.11) shall be used above the route sign of a numbered toll facility in any route sign assembly that provides directions to the toll route from another highway unless the route sign incorporates the term “TOLL” within the design of the route sign (see Figure 2F-4).**
- 05 **A rectangular panel with the black legend TOLL on a yellow background shall be incorporated into the guide signs leading road users to a toll highway unless the route sign incorporates the term “TOLL” within the design of the route sign. If a toll route sign is used on a guide sign, a toll banner shall be used (see Figure 2F-5).**
- 06 **Guide signs for toll highways, toll plazas, and tolled or priced managed lanes (see Chapter 2G) shall have white legends and borders on green backgrounds, except as specifically provided by Sections 2F.13 through 2F.16.**

Figure 2F-6TB. Examples of Guide Signs from the Main Lanes to a Toll Ramp

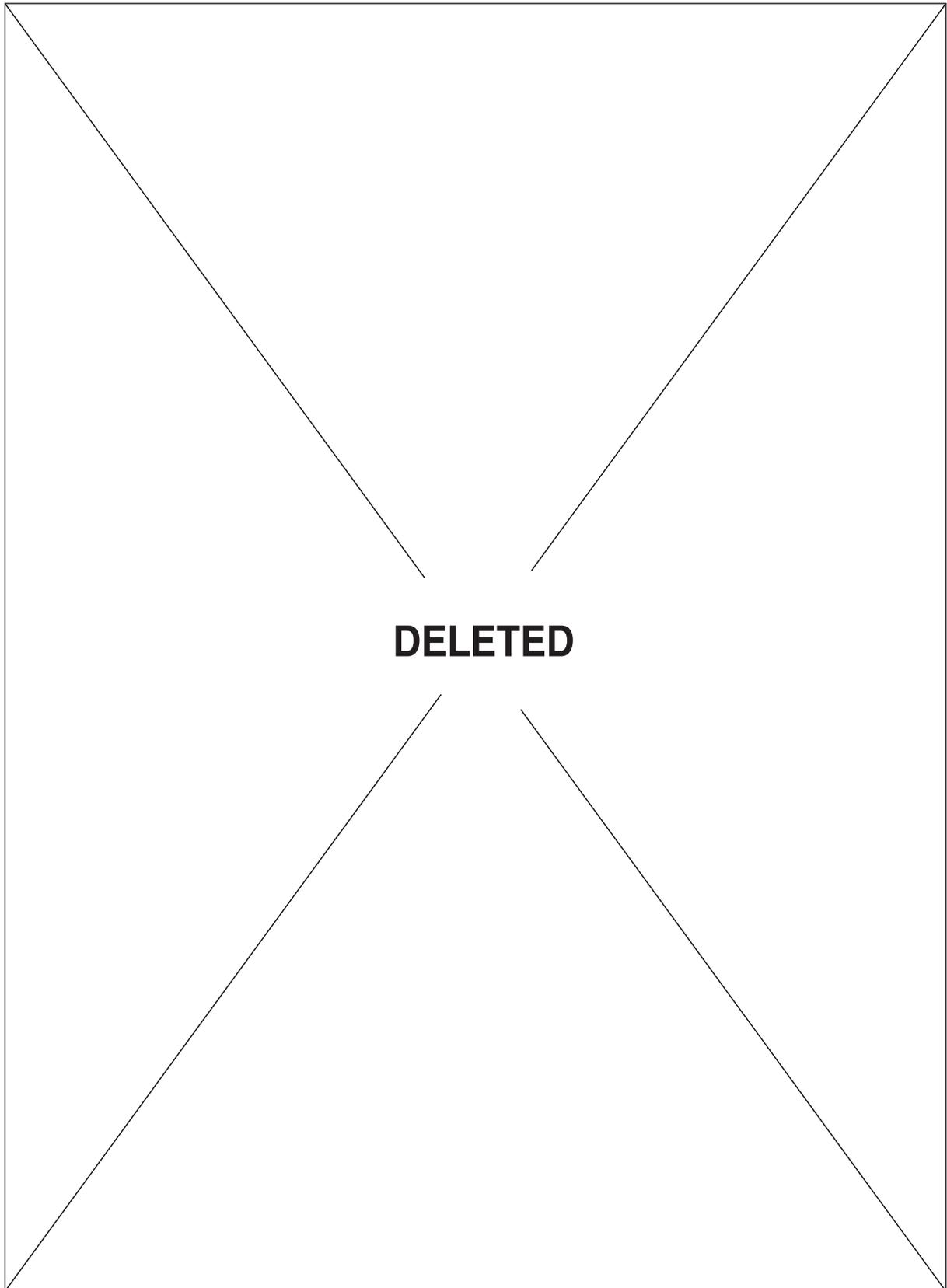


Figure 2F-7. Examples of Guide Signs for Alternative Toll and Non-Toll Ramp Connections to a Non-Toll Highway

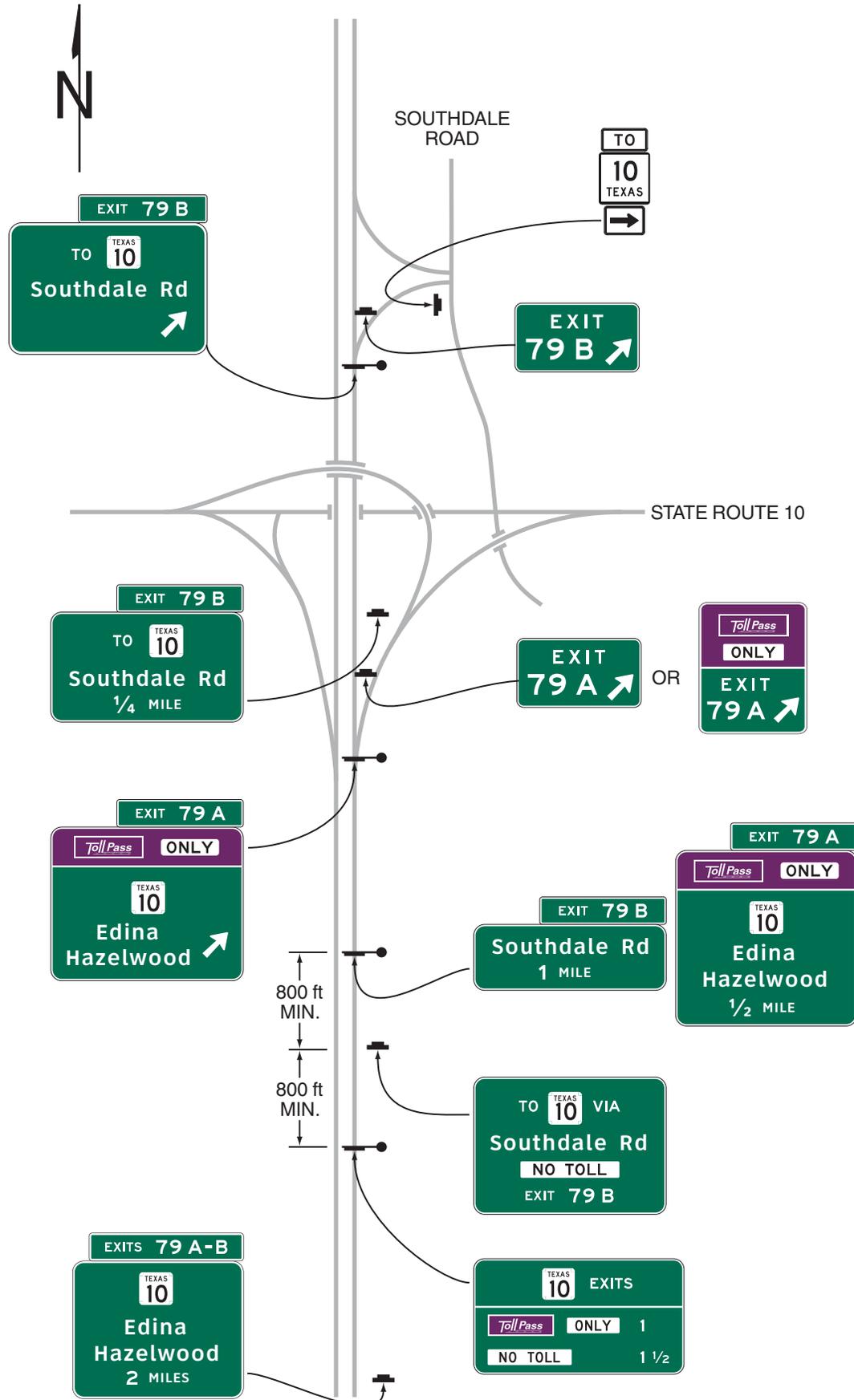


Figure 2F-7TA. Non-Toll Roadway Converts to Toll Roadway

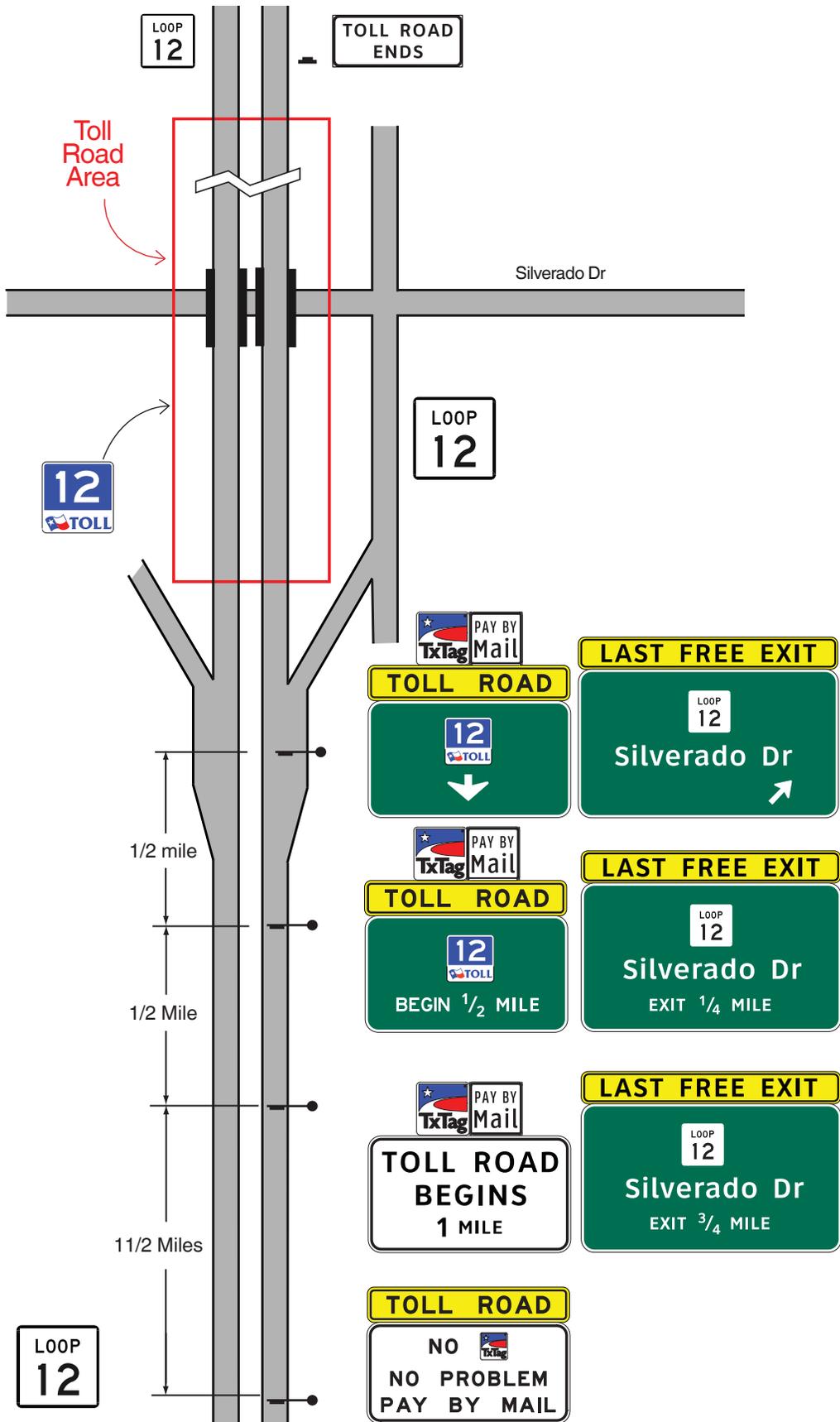
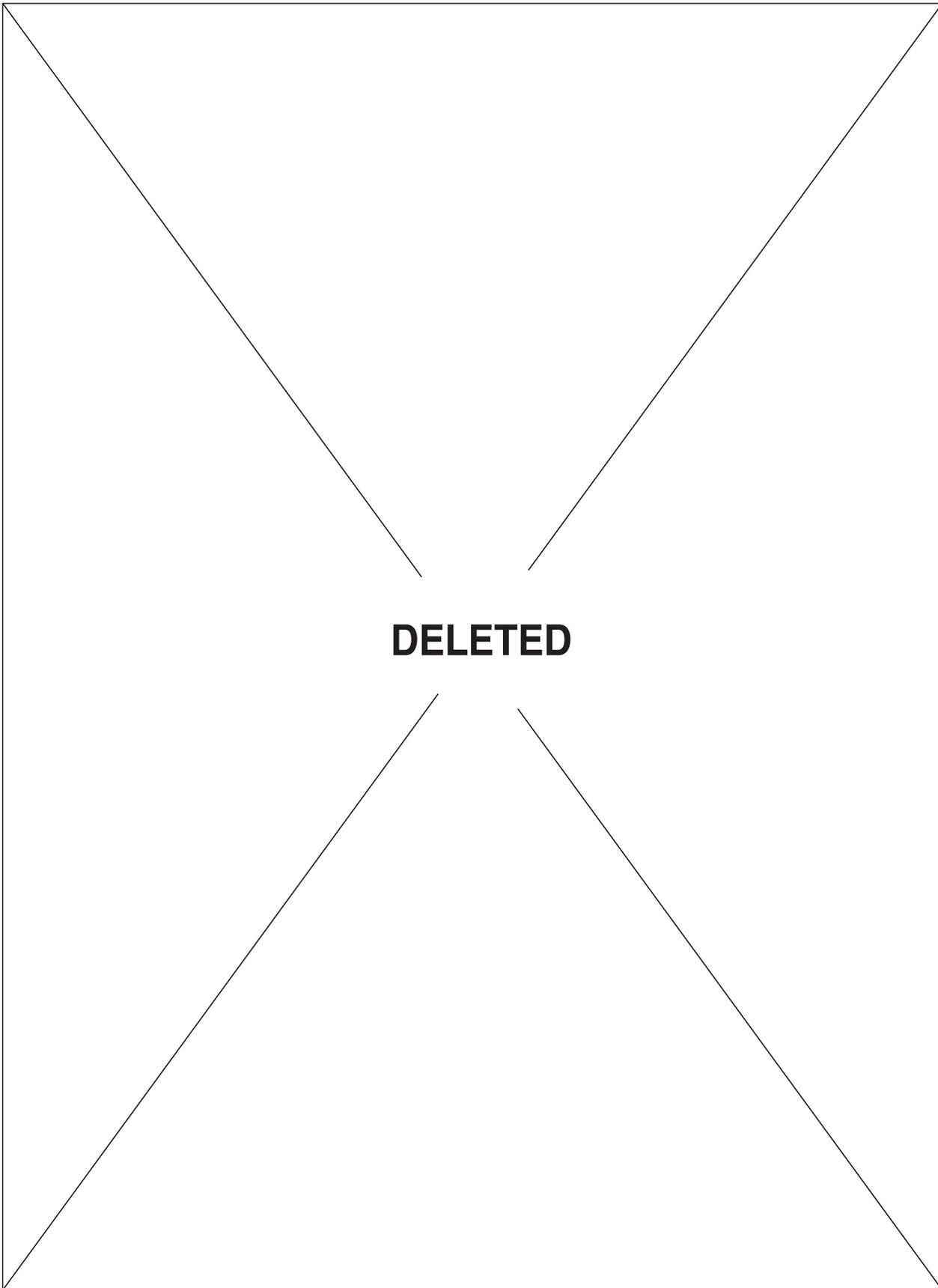


Figure 2F-7TB. Non-Toll Roadway with Left Lane Entrance to Toll Lane



CHAPTER 2G. PREFERENTIAL AND MANAGED LANE SIGNS

Section 2G.01 Scope

Support:

- 01 Preferential lanes are lanes designated for special traffic uses such as high-occupancy vehicles (HOVs), light rail, buses, taxis, or bicycles. Preferential lane treatments might be as simple as restricting a turning lane to a certain class of vehicles during peak periods, or as sophisticated as providing a separate roadway system within a highway corridor for certain vehicles.
- 02 Preferential lanes might be barrier-separated (on a separate alignment or physically separated from the other travel lanes by a barrier or median), buffer-separated (separated from the adjacent general-purpose lanes only by a narrow buffer area created with longitudinal pavement markings), or contiguous (separated from the adjacent general-purpose lanes only by a lane line). Preferential lanes might allow continuous access with the adjacent general-purpose lanes or restrict access only to designated locations. Preferential lanes might be operated in a constant direction or operated as reversible lanes. Some reversible preferential lanes on a divided highway might be operated counter-flow to the direction of traffic on the immediately adjacent general-purpose lanes.
- 03 Preferential lanes might be operated on a 24-hour basis, for extended periods of the day, during peak travel periods only, during special events, or during other activities.
- 04 Open-road tolling lanes and toll plaza lanes that segregate traffic based on payment method are not considered preferential lanes. Chapter 2F contains information regarding signing of open-road tolling lanes and toll plaza lanes.
- 05 Managed lanes typically restrict access with the adjacent general-purpose lanes to designated locations only.
- 06 Under certain operational strategies, such as the occupancy requirement of an HOV lane changing in response to actual congestion levels, a managed lane is a special type of preferential lane (see Sections 2G.03 through 2G.07).
- 07 A managed lane operated on a real-time basis in response to changing conditions might be operated as an HOV lane for a period of time as needed to manage congestion levels.
- 08 Sections 2G.16 through 2G.18 contain additional information regarding signs for managed lanes that use tolling or pricing as a management strategy.
- 09 Section 9B.04 contains information regarding Preferential Lane signs for bike lanes.

Section 2G.02 Sizes of Preferential and Managed Lane Signs

Standard:

- 01 **Except as provided in Section 2A.11, the sizes of preferential and managed lane signs that have standardized designs shall be as shown in Table 2G-1.**

Support:

- 02 Section 2A.11 contains information regarding the applicability of the various columns in Table 2G-1.

Option:

- 03 Signs larger than those shown in Table 2G-1 may be used (see Section 2A.11).

Section 2G.03 Regulatory Signs for Preferential Lanes – General

Standard:

- 01 **When a preferential lane is established, the Preferential Lane regulatory signs (see Figure 2G-1) and pavement markings (see Chapter 3D) for these lanes shall be used to advise road users.**

Support:

- 02 Preferential Lane (R3-10 series through R3-15 series) regulatory signs consist of several different general types of regulatory signs as follows (see Figure 2G-1):
 - A. Vehicle Occupancy Definition signs define the vehicle occupancy requirements applicable to an HOV lane (such as “2 OR MORE PERSONS PER VEHICLE”) or types of vehicles not meeting the minimum occupancy requirement (such as motorcycles or ILEVs) that are allowed to use an HOV lane (see Section 2G.04).
 - B. Periods of Operation signs notify road users of the days and hours during which the preferential restrictions are in effect (see Section 2G.05).
 - C. Preferential Lane Advance signs notify road users that a preferential lane restriction begins ahead (see Section 2G.06).
 - D. Preferential Lane Ends signs notify users of the termination point of the preferential lane restrictions (see Section 2G.07).

Table 2G-1. Managed and Preferential Lanes Sign and Plaque Minimum Sizes (Sheet 1 of 2)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Oversized
			Single Lane	Multi-Lane			
Preferential Lane Vehicle Occupancy Definition (post-mounted)	R3-10,10a	2G.04	30 x 42	30 x 42	36 x 60	78 x 96	78 x 96
Preferential Lane Periods of Operation (post-mounted)	R3-11 series	2G.05	30 x 42	30 x 42	36 x 60	78 x 96	78 x 96
Motorcycles Allowed (plaque)	R3-11P	2G.03	30 x 15	30 x 15	36 x 18	78 x 36	78 x 36
Preferential Lane Ahead or Ends (post-mounted)	R3-12 series	2G.06	30 x 42	30 x 42	36 x 60	48 x 84	48 x 84
Preferential Lane Vehicle Occupancy Definition (overhead)	R3-13T,13aT	2G.04	66 x 36	66 x 36	84 x 48	144 x 72	144 x 72
Preferential Lane Vehicle Occupancy Definition (overhead)	R3-13bT	2G.04	48 x 42	48 x 42	60 x 54	90 x 84	90 x 84
HOV Lane Periods of Operation (overhead)	R3-14T,14bT	2G.05	72 x 48	72 x 48	96 x 60	132 x 84	132 x 84
HOV Lane Periods of Operation (overhead)	R3-14aT	2G.05	72 x 60	72 x 60	96 x 72	132 x 102	132 x 102
Preferential Lane Periods of Operation (overhead)	R3-14c	2G.05	90 x 60	90 x 60	108 x 72	156 x 102	168 x 102
HOV Lane Ahead (overhead)	R3-15	2G.06	66 x 36	66 x 36	84 x 48	102 x 60	102 x 60
HOV Lane Begins XX Miles (overhead)	R3-15aT	2G.06	72 x 72	72 x 72	96 x 96	120 x 120	120 x 120
HOV Lane Ends (overhead)	R3-15bT	2G.07	—	—	162 x 72	162 x 72	—
HOV Lane Ends (overhead)	R3-15b,15c	2G.07	66 x 36	66 x 36	84 x 48	102 x 60	102 x 60
Preferential Lane Ahead or Ends (overhead)	R3-15d,15e	2G.07	42 x 36	42 x 36	54 x 48	72 x 60	72 x 60
HOV Lane Ends 1/2 Mile (overhead)	R3-15gT	2G.07	—	—	162 x 96	162 x 96	—
Priced Managed Lane Vehicle Occupancy Definition (post-mounted)	R3-40T	2G.17	—	—	54 x 66	54 x 66	66 x 78
Priced Managed Lane Ends (post-mounted)	R3-42,42b	2G.17	—	—	48 x 60	48 x 60	60 x 78
Priced Managed Lane Ends Advance (post-mounted)	R3-42a,42c	2G.17	—	—	48 x 66	48 x 66	60 x 84
Priced Managed Lane Vehicle Occupancy Definition	R3-43T	2G.17	—	—	138 x 66	138 x 66	—
Priced Managed Lane Periods of Operation (overhead)	R3-44	2G.17	—	—	90 x 84	90 x 84	—
Priced Managed Lane Periods of Operation (overhead)	R3-44a	2G.17	—	—	132 x 84	132 x 84	—
Priced Managed Lane Ends (overhead)	R3-45	2G.17	—	—	90 x 66	90 x 66	—
Priced Managed Lane Ends (overhead)	R3-45a	2G.17	—	—	114 x 66	114 x 66	—
Priced Managed Lane Toll Rate	R3-48T	2G.17	—	—	Varies	Varies	—
Priced Managed Lane Toll Rate	R3-48aT	2G.17	—	—	Varies	Varies	—
Priced Managed Lane Toll Rate	R3-50T	2G.17	—	—	276 x 114	276 x 114	—
Priced Managed Lane Toll Rate	R3-50aT	2G.17	—	—	276 x 144	276 x 144	—
HOV (plaque)	W16-11P	2G.09	24 x 12	24 x 12	30 x 18	30 x 18	30 x 18
Preferential Lane Entrance Gore	E8-1T	2G.10	—	—	48 x 114	48 x 114	—
Preferential Lane Intermediate Entrance Gore	E8-1aT	2G.10	—	—	48 x 102	48 x 102	—
Preferential Lane Entrance Direction (overhead)	E8-2T	2G.11	—	—	162 x 132	162 x 132	—
Preferential Lane Entrance Advance	E8-3T	2G.11	—	—	162 x 120	162 x 120	—
Preferential Lane Direct Exit Gore	E8-4	2G.15	—	—	60 x 78	60 x 78	—
Preferential Lane Intermediate Egress Direction	E8-5T	2G.13	—	—	Varies x 120	Varies x 120	—

Advance Guide signs and overhead Exit Direction signs shall be provided in advance of and at the entry point to each freeway-to-freeway preferential lane ramp (see Figure 2G-16).

Guidance:

- 06 *The use of guide signs for preferential lanes at freeway interchanges should comply with the provisions for guide signs established in this Manual.*

Support:

- 07 Guide signs for direct access ramps for preferential lanes at interchanges connecting two freeways are similar to those for a connecting ramp between two freeway facilities.

Section 2G.16 Signs for Priced Managed Lanes – General

Support:

- 01 A priced managed lane is a managed lane that employs tolling or pricing, typically through electronic toll collection, to manage congestion levels and maintain a certain level of service for users of the facility. A priced managed facility typically provides a less congested alternative to adjacent lanes along the same designated route, or to a nearby facility, that experience recurring congestion during peak periods. A priced managed lane might allow non-toll travel by certain vehicles based on occupancy or other criteria. A variety of operational management strategies might be used in conjunction with tolling or pricing.
- 02 The number and combination of operational strategies that are applied to a managed lane to manage congestion or improve efficiency might be practically limited by the amount of information that can be legibly displayed on signs or in signing sequences and still be readily comprehended by road users. Such factors to consider when evaluating alternatives for managed lanes are locations of signs for general-purpose interchanges and for other roadway conditions, the number of intermediate access points between the managed and general-purpose lanes and the need to repeat the operational information, and the distance over which a signing sequence that displays all of the eligibility requirements can be displayed.
- 03 Because managed lanes have the capability to employ a variety of operational strategies on a changing basis, it is not practical to assign a naming convention to such lanes for the purpose of signing based on the specific operational management strategies, as is more readily accomplished with other types of preferential lanes, such as HOV, Bus, or Bike lanes. Instead, the various requirements, restrictions, and eligibility criteria are more appropriately conveyed through a sequence of regulatory and guide signs with a more encompassing designation for the purpose of providing directional information.
- 04 As priced managed lanes become more prevalent as an operational strategy, it will be important to establish a uniform naming convention to distinguish those lanes that are an alternative to travel on adjacent general-purpose lanes on the same designated route to effectively communicate to motorists the range of basic requirements for similar facilities in different regions.

Standard:

- 05 **Priced managed lanes that are adjacent to general-purpose lanes along the same designated route shall be signed using the legend EXPRESS or EXPRESS LANE(S). This provision shall apply when any of the following operational strategies is used for a managed lane:**
- A. All users of the managed lane are charged a fixed or variable toll;**
 - B. General-purpose traffic using the managed lane is charged a fixed or variable toll, but HOV traffic is allowed to travel without being charged a toll on either a full- or part-time basis;**
 - C. General-purpose traffic using the managed lane is charged a fixed or variable toll, but HOV traffic is offered a discounted toll on either a full- or part-time basis; or**
 - D. General-purpose traffic using the managed lane is charged a fixed or variable toll, but HOV traffic registered with a local program travels at a discounted toll or without being charged a toll on either a full- or part-time basis (a transponder or other identifier is typically required of HOVs to indicate registration in conjunction with electronic or visual enforcement and verification of vehicle occupancy).**
- 06 **The legends EXPRESS and EXPRESS LANE(S) shall not be used on signs for entrances to highways on which all lanes are managed and there are no adjacent general-purpose lanes on the same designated route. The legends EXPRESS and EXPRESS LANE(S) shall not be used on signs for a managed ramp connection that provides an alternative to a general-purpose ramp connection (see Figure 2F-7), except where the ramp leads directly to a managed lane as described in Section 2G.14. The legends EXPRESS and EXPRESS LANE(S) shall not be used on signs for open-road tolling lanes that bypass a conventional toll plaza (see Chapter 2F).**

Figure 2G-15. Examples of Guide Signs for Direct HOV Lane Entrance and Exit Ramps

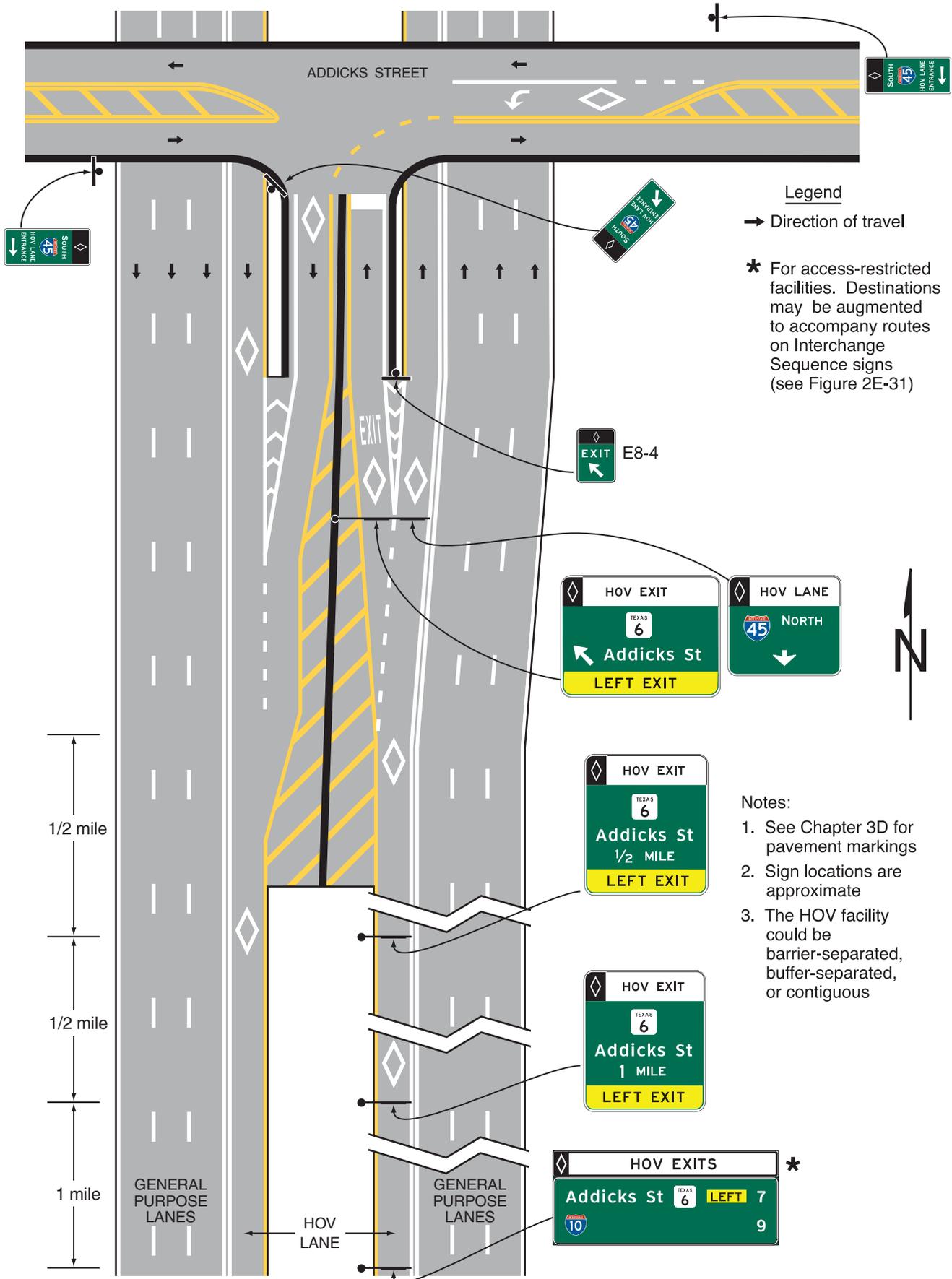
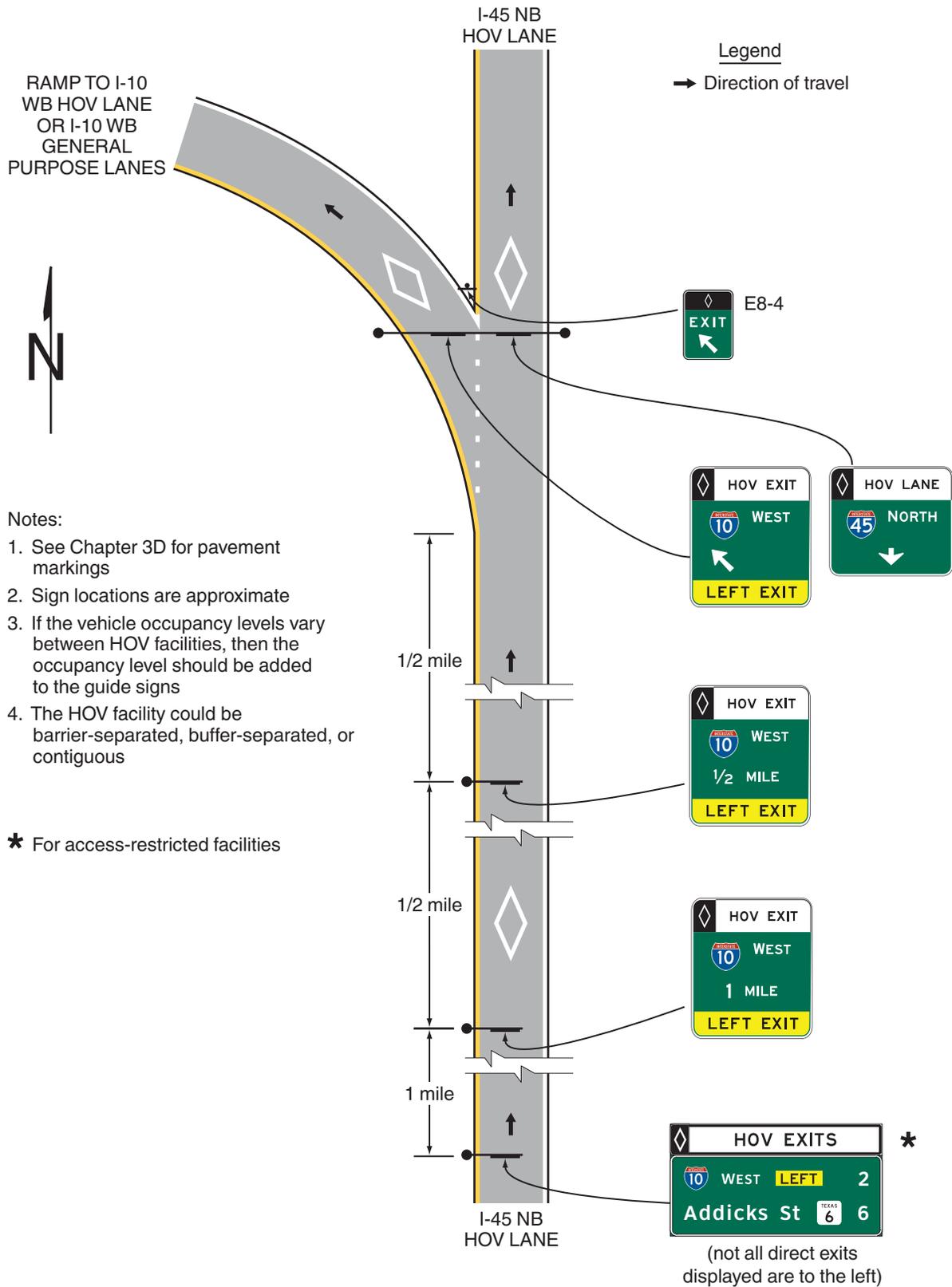


Figure 2G-16. Examples of Guide Signs for a Direct Access Ramp between HOV Lanes on Separate Freeways



07 The diamond symbol shall be reserved exclusively for preferential lanes whose operational strategy is occupancy-based only (see Sections 2G.03 through 2G.14) and shall not be used to designate a managed lane in which other operational strategies, such as tolling and pricing, are employed to allow general-purpose traffic to use the lane.

Section 2G.17 Regulatory Signs for Priced Managed Lanes

Standard:

01 Except as otherwise provided in this Section, the provisions of Sections 2G.03 through 2G.07 regarding regulatory signs for Preferential lanes shall apply to priced managed lanes operated at all times or at certain times with a toll payment requirement of some or all vehicles to use the lane(s). Such managed lanes shall use changeable message signs or changeable message elements within static signs to display the appropriate regulatory sign messages only when they are in effect.

02 Regulatory signs for preferential lanes shall be appropriately modified for adaptation to a priced managed lane, where applicable, as shown in Figure 2G-17.

03 Regulatory signs shall be used to indicate the toll charged. If the toll varies, regulatory signs that include changeable message elements, such as the R3-48T and R3-48aT signs that are shown in Figure 2G-17, shall be used to display the actual toll amount in effect at any given time.

04 When only vehicles with a registered ETC account are allowed to use a managed lane where some or all vehicles are charged a toll, regulatory signs to indicate such a restriction shall be provided and shall incorporate the pictograph adopted by the toll facility's ETC payment system and the word ONLY (see Section 2G.18 for the incorporation of such regulatory legends into the guide signs for the entrances to such facilities). The display of the ETC system pictograph shall comply with the provisions of Sections 2F.03 and 2F.04 as shown in Figures 2G-17 and 2G-18.

05 When HOV traffic is allowed to use a priced managed lane without paying a toll and registration in a local program is not required to receive the toll exemption, the Vehicle Occupancy Definition (R3-10 or R3-13T) signs (see Section 2G.04) shall be modified to delete the diamond symbol to create priced managed lane Vehicle Occupancy Definition (R3-40T and R3-43T) signs to indicate the minimum occupancy related to the management strategy (see Figure 2G-17).

06 A priced managed lane Periods of Operation (R3-44 or R3-44a) sign (see Figure 2G-17) shall be installed at the beginning or initial entry point, and at any intermediate entry points where vehicles are allowed to legally enter an access-restricted priced managed lane.

07 When the vehicle occupancy required for non-toll use of a managed lane is varied as a part of a priced managed lane operational strategy, regulatory signs that include changeable message elements shall be used to display the required vehicle occupancy in effect for non-toll travel.

Option:

08 Where registration in a local program or ETC account is required for HOV traffic to travel in a priced managed lane without being charged a toll or by being charged a discounted toll, such information may be displayed on a separate sign within the sequence of the required regulatory and guide signs.

Standard:

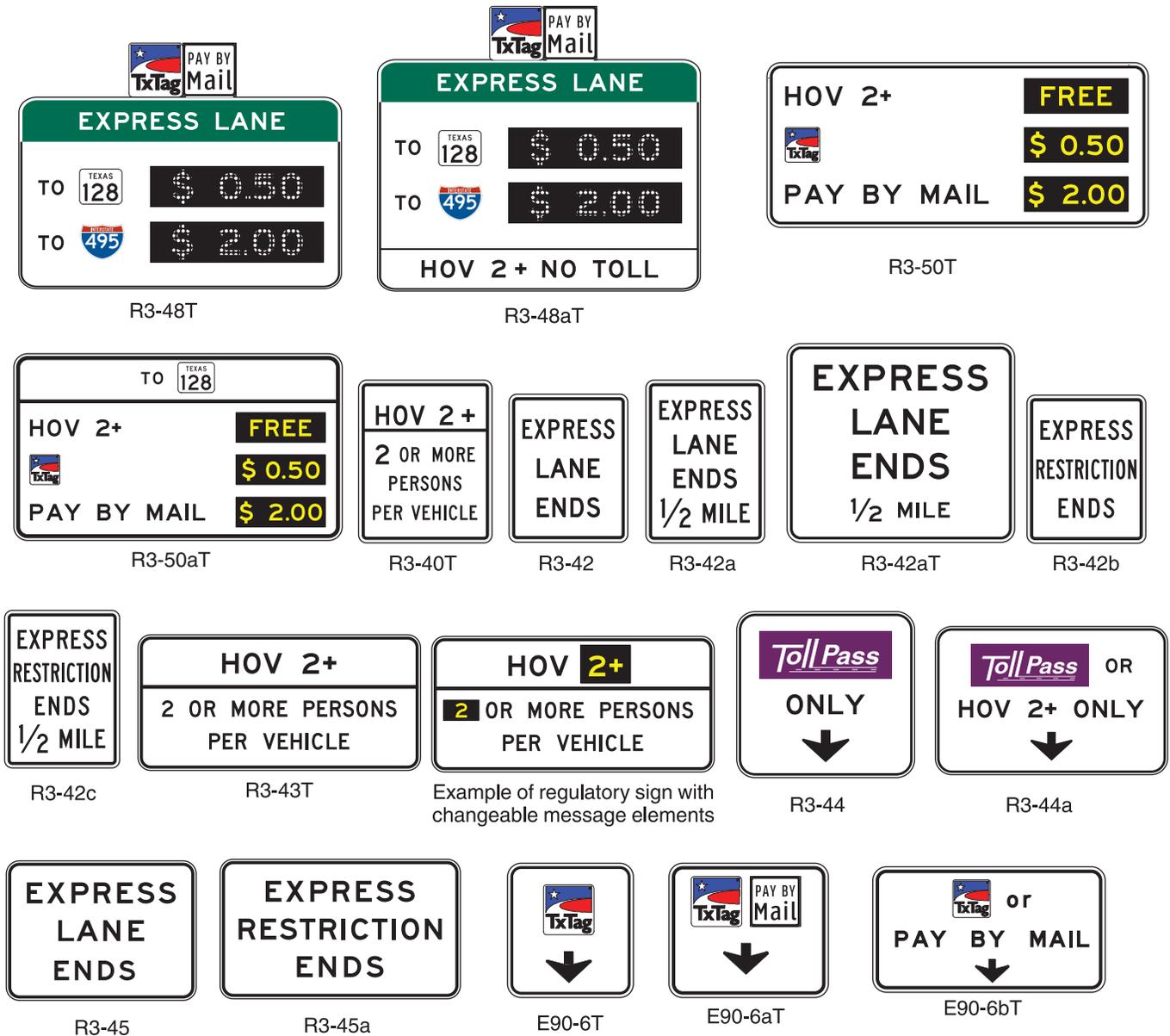
09 R3-42 Series and R3-45 Series signs (see Figure 2G-17) shall be installed in accordance with the provisions of Section 2G.07 to indicate the termination of a priced managed lane or restriction. The R3-42, R3-42a, and R3-45 signs shall be used only where the managed lane and restriction end and traffic must merge into the general-purpose lanes. The R3-42b, R3-42c, and R3-45a signs shall be used only where the managed lane restriction ends and the lane becomes a general-purpose lane.

Section 2G.18 Guide Signs for Priced Managed Lanes

Standard:

01 Except as otherwise provided in this Section, guide signs for barrier-separated, buffer-separated, and contiguous managed lanes shall follow the specific provisions for Preferential Lane guide signs contained in Sections 2G.10 through 2G.15. Except as otherwise provided in this Section, guide signs for highways

Figure 2G-17. Regulatory Signs for Managed Lanes



Notes:

1. The ETC pictograph shown is an example only. The pictograph for the toll facility's adopted ETC system shall be used.
2. Changeable message sign elements shall be used for the numerals displayed for the variable tolls.

on which all lanes are managed shall follow the general provisions for freeway and expressway guide signs as contained in Chapter 2E as a whole. Guide signs for highways on which all lanes are managed and tolling or pricing is used as a management strategy shall follow the applicable provisions for toll road guide signs as contained in Chapter 2F, in addition to the general provisions of Chapter 2E.

02 If fixed or variable tolls are used as an operational strategy for a managed lane, the guide signs shall comply with the provisions of Sections 2F.03, 2F.04, and 2F.17 regarding the use, size, and placement of ETC-account pictographs.

Support:

- 03 Figure 2G-18 shows examples of Guide signs for entrances to priced managed lanes and other ETC account-only toll facilities that incorporate header panels with ETC account pictographs and regulatory legends.

Guidance:

- 04 *Exit Destination supplemental guide signs, identifying final destination and downstream exit locations accessible from the managed lane (see Figure 2G-19), should be installed in advance of the initial entry points to priced managed lanes. These signs should be located in accordance with the provisions of Paragraph 5 of Section 2G.11.*
- 05 *For managed lanes that are available as an alternative to travel on adjacent general-purpose lanes on the same designated route, changeable message signs indicating the comparative travel times or congestion levels using the managed lanes versus the general-purpose lanes (see Figure 2G-20) should be installed in advance of the initial and intermediate entry points to the managed lanes.*

Option:

- 06 Changeable message signs may also be used on non-managed highways to display comparative travel times or congestion levels for a nearby managed highway.

Standard:

- 07 **Guide signs at the initial and intermediate entry points to a priced managed lane in which all general-purpose passenger vehicles are allowed shall include the legend EXPRESS or EXPRESS LANE(S). The guide signs shall incorporate the pictograph of the ETC account system into a header panel within the guide sign in accordance with Sections 2F.03, 2F.04, and 2F.17. For a priced managed lane that allows non-toll travel by HOV traffic without registration in a local program, the header panel shall be modified to a regulatory format to display both the pictograph of the ETC account system and the minimum occupancy requirement for non-toll travel with a black legend on a white background (see Figure 2G-19).**
- 08 **Guide signs at the initial and intermediate entry points to a managed lane that allows only HOV traffic with either a fixed or variable occupancy requirement shall follow the provisions of Sections 2G.10 through 2G.12 and 2G.14.**

Support:

- 09 Figures 2G-21T through 2G-24T show examples of guide signs for various configurations of initial and intermediate entrances to a priced managed lane.

Figure 2G-18. Examples of Guide Signs for Entrances to Priced Managed Lanes

A - ENTRANCE TO A PRICED MANAGED LANE FROM A GENERAL PURPOSE LANE



B - DIRECT ENTRANCE TO A PRICED MANAGED LANE FROM A CROSSROAD



Note: 1. The ETC pictographs shown are examples only. The pictograph for the toll facility's adopted ETC system shall be used.
 2. The examples shown are for facilities on which registration in a toll account program is required for toll payments.

**Figure 2G-21TA. Example of Signing for the Entrance to an Entrance-
Restricted Priced Manage Lane (Toll Lane)**

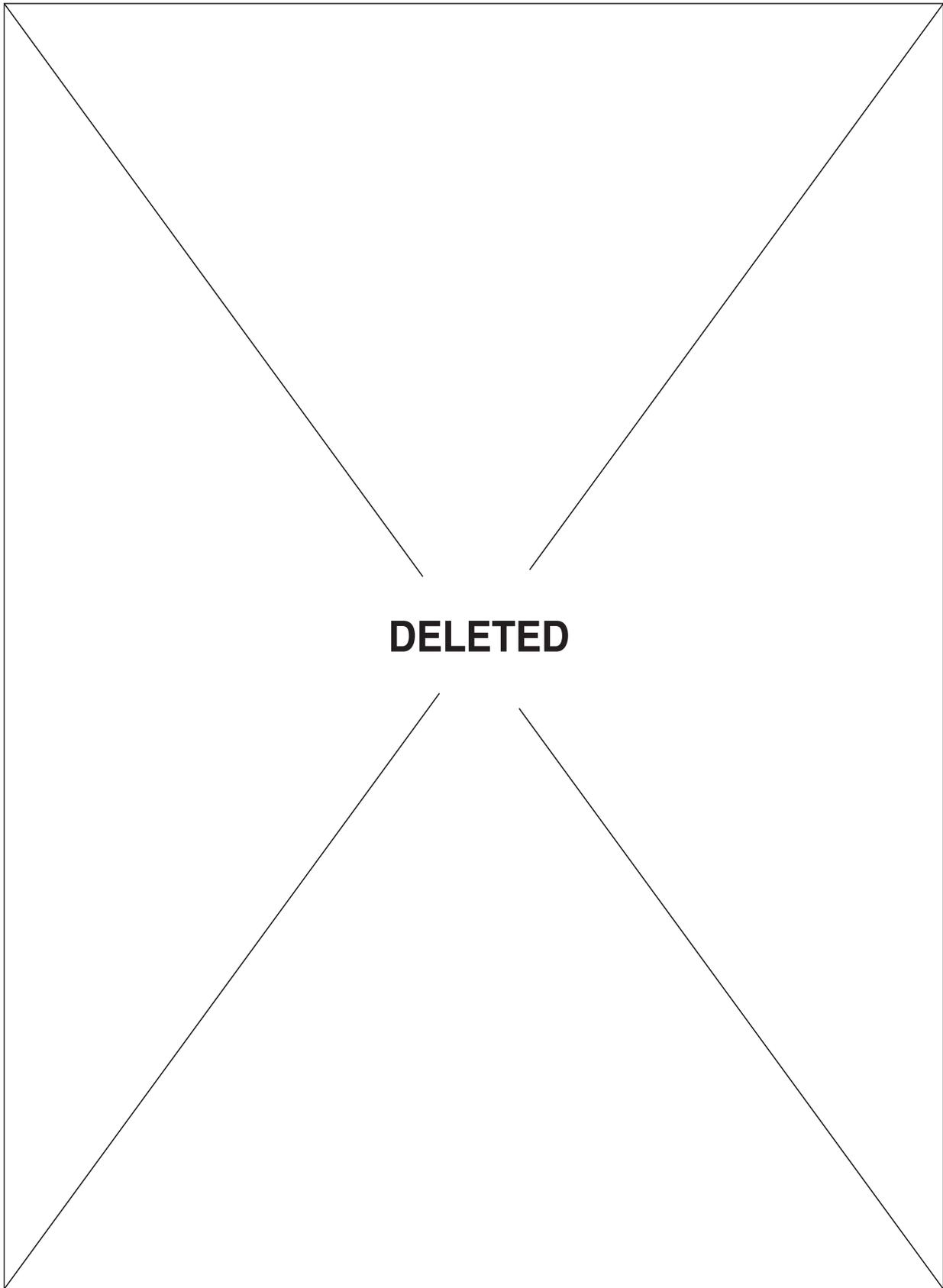
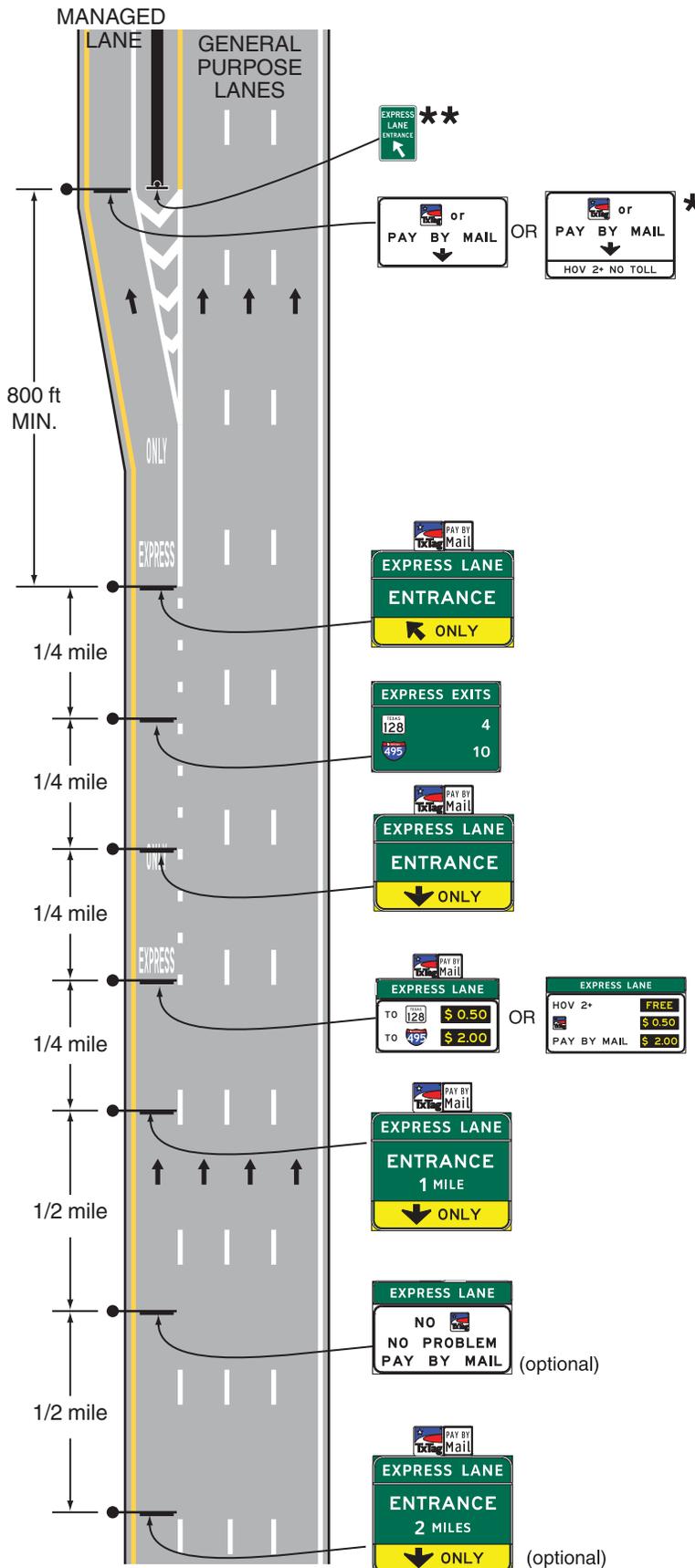


Figure 2G-22T. Example of Signing for the Entrance to an Access-Restricted Priced Managed Lane Where a General-Purpose Lane Becomes the Managed Lane



Legend

→ Direction of travel

Notes:

1. For access to a managed lane on the right-hand side, the same signing sequence would be used with adjustments made to sign messages
2. Geometry is for illustrative purposes only; use locally applied geometric criteria
3. The minimum vehicle occupancy requirement and hours of operation on the sign may vary for each facility
4. See Chapter 3D for pavement markings
5. See Figure 2G-21T for additional signing

* Potential location of a Changeable Message Sign (CMS) for reversible or contraflow operations

** Barrier-separated facilities only

Figure 2G-24TA. ~~Example of Signing for the Intermediate Entry to, Egress from, and End of Access-Restricted Priced Toll Lanes~~

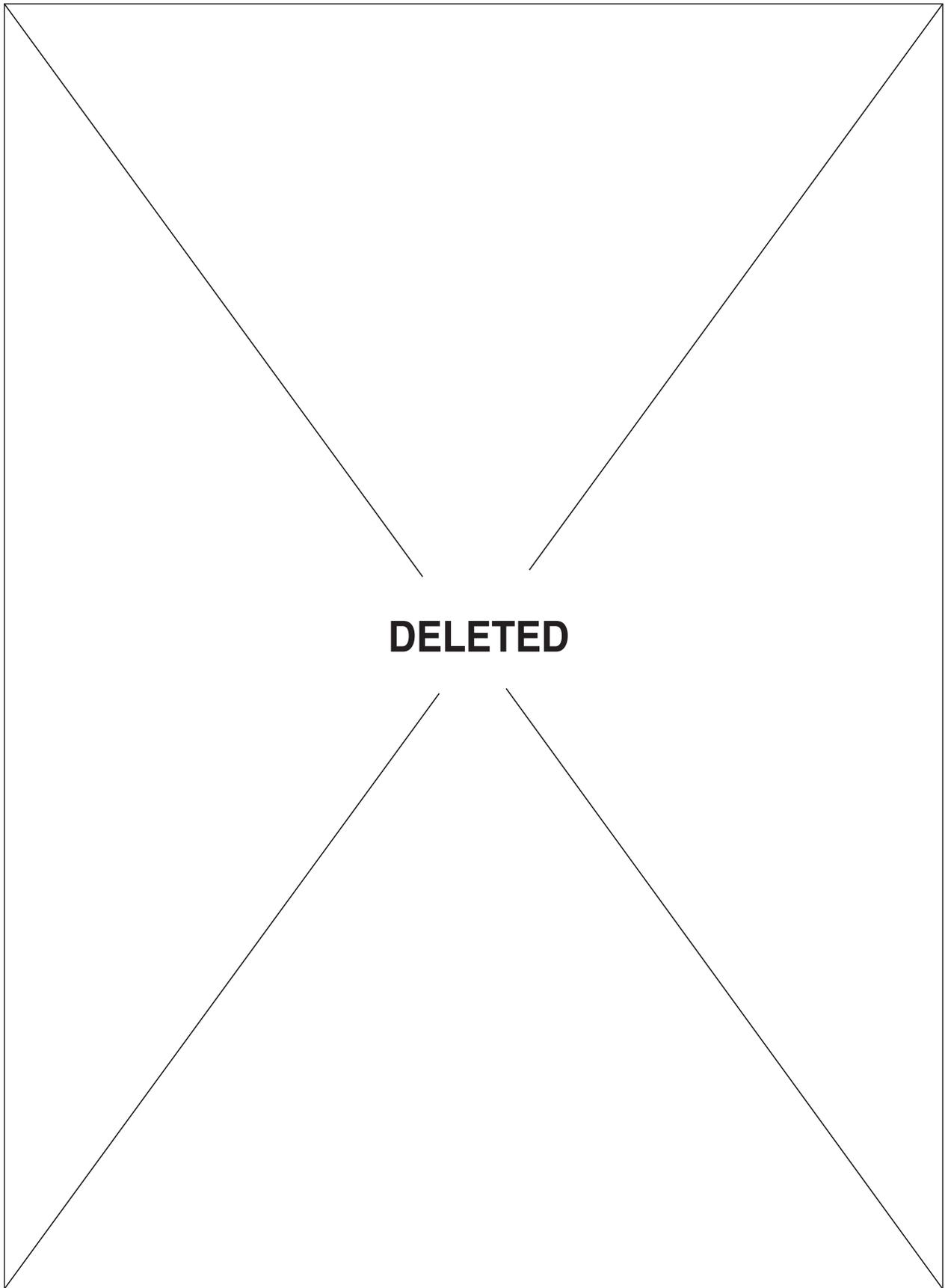


Figure 2G-25. Examples of Guide Signs for an Intermediate Egress from a Barrier- or Buffer-Separated Managed Lane

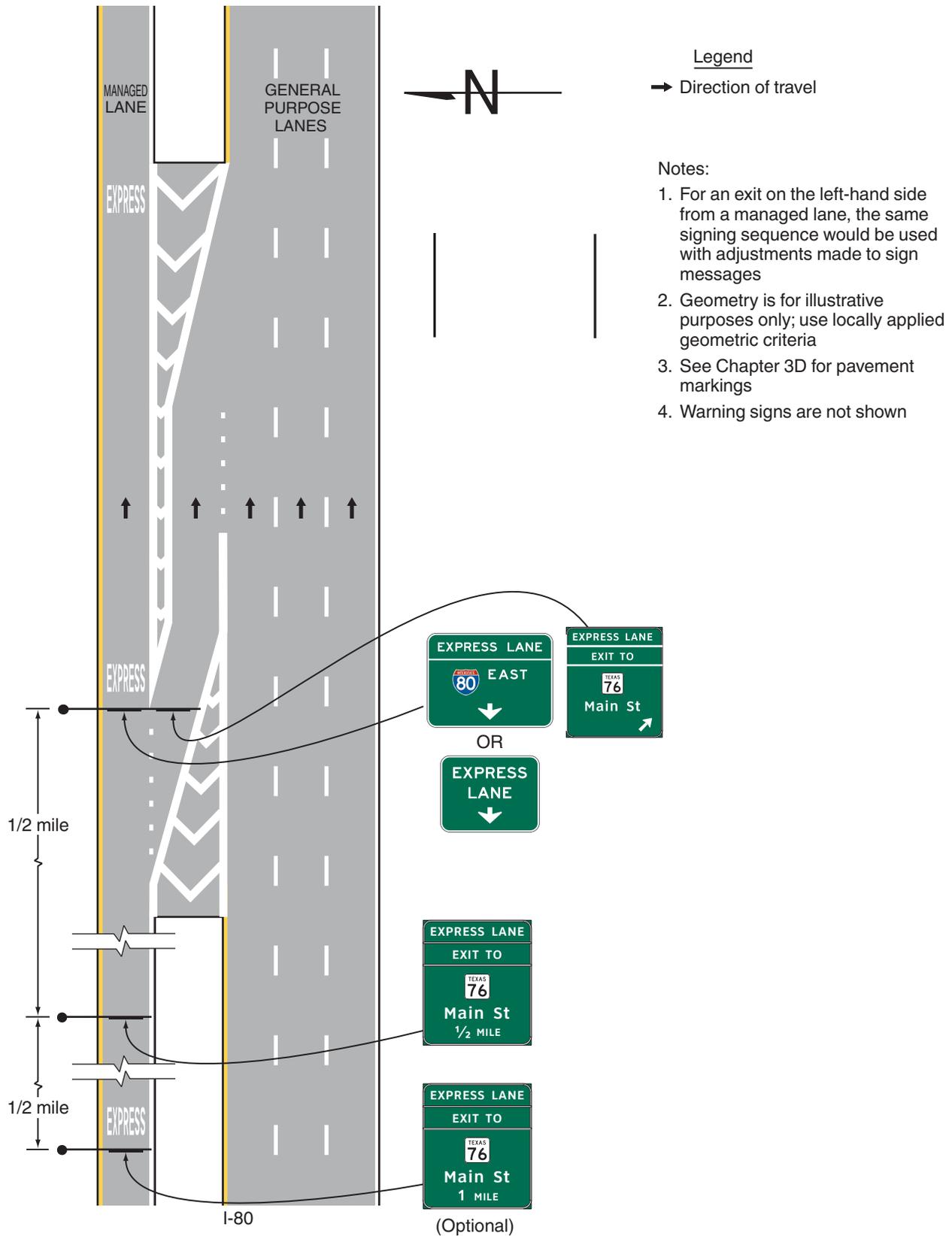


Table 2M-1. Category Chart for Recreational and Cultural Interest Area Symbols

General	
Bear Viewing Area	RS-012
Bus Stop	RS-031
Campfires *	RS-042
Cans or Bottles *	RS-101
Cultural Interest Area	RS-142
Dam	RS-009
Deer Viewing Area	RS-011
Falling Rocks *	RS-008
Fire Extinguisher *	RS-090
Lighthouse	RS-007
Lookout Tower	RS-006
Nature Study Area	RS-141
Pets on Leash *	RS-017
Pick-Up Trucks	RS-140
Point of Interest	RS-080
Radios *	RS-103
Rattlesnakes *	RS-099
Recycling *	RS-200
Sea Plane	RS-115
Smoking *	RS-002
Snack Bar *	RS-102
Stay on Trail *	RS-123
Strollers *	RS-111
Tunnel	RS-005
Viewing Area	RS-036
Walk on Boardwalk *	RS-122
Wood Gathering *	RS-120

Accommodations	
Baby Changing Station (Men's Room)	RS-137
Baby Changing Station (Women's Room)	RS-138
Men's Restroom	RS-021
Parking	RS-034
Recreational Vehicle Site	RS-104
Restrooms	RS-022
Sleeping Shelter *	RS-037
Trailer Site	RS-040
Walk-In Camp	RS-148
Women's Restroom	RS-023

Services	
Drinking Water	RS-013
Electrical Hook-Up	RS-150
Firewood Cutting *	RS-112
First Aid	RS-024
Grocery Store	RS-020
Kennel	RS-045
Laundromat	RS-085
Litter Receptacle	RS-086
Lockers/Storage *	RS-030
Mechanic	RS-027
Picnic Shelter	RS-039
Picnic Site	RS-044
Post Office	RS-026
Radiator Water	RS-124
Ranger Station	RS-015
Sanitary Station	RS-041
Showers *	RS-035
Stable	RS-073
Theater	RS-109
Trail Shelter *	RS-043
Tramway	RS-071
Trash Dumpster	RS-091

Land Recreation	
All-Terrain Trail	RS-095
Amphitheater	RS-070
Archery	RS-116
Baseball *	RS-096
Climbing *	RS-082
Corral	RS-149
Driving Tour	RS-113
Exercise/Fitness	RS-097
Golfing *	RS-128
Hang Gliding	RS-126
Hiking Trail	RS-068
Horse Trail	RS-064
In-Line Skating	RS-125
Interpretive Trail	RS-114
Off-Road Vehicle Trail	RS-067
Rock Collecting *	RS-083
Skateboarding *	RS-098
Spelunking/Caves	RS-084
Technical Rock Climbing	RS-081
Tennis	RS-129
Wildlife Viewing	RS-076

Water Recreation	
Beach	RS-145
Boat Motor	RS-147
Boat Ramp	RS-054
Canoeing	RS-079
Diving	RS-062
Fish Cleaning *	RS-093
Fish Hatchery	RS-010
Fish Ladder *	RS-089
Fishing Area	RS-063
Fishing Pier	RS-119
Hand Launch/Small Boat Launch	RS-117
Jet Ski/Personal Watercraft	RS-121
Kayaking	RS-118
Lifejackets *	RS-094
Marina	RS-053
Motorboating	RS-055
Rafting	RS-146
Rowboating	RS-057
Sailing	RS-056
Scuba Diving	RS-060
Seal Viewing	RS-106
Surfing	RS-059
Swimming	RS-061
Tour Boat	RS-087
Wading	RS-088
Waterskiing	RS-058
Whale Viewing	RS-107
Wind Surfing	RS-108

Winter Recreation	
Chair Lift/Ski Lift	RS-105
Cross Country Skiing	RS-046
Dog Sledding	RS-143
Downhill Skiing	RS-047
Ice Fishing	RS-092
Ice Skating	RS-050
Ski Jumping	RS-048
Sledding	RS-049
Snow Tubing	RS-144
Snowboarding	RS-127
Snowmobiling	RS-052
Snowshoeing	RS-078
Winter Recreational Area	RS-077

* For non-road use only

Table 2M-2T. Traffic Generator Criteria

	Population Range	Over 250,000	50,000-250,000	15,000-50,000	Under 15,000
Type of Generator	Specific Criteria	Major Metropolitan Areas	Urban Areas	Suburban and Rural Areas	Rural City
Airports (Publicly Owned)	Number of Regularly Scheduled Movements (One Way)	15 daily	10 daily	5 daily	2 daily
	Maximum distance from intersecting highway	5 miles	10 miles	10 miles	10 miles
Airports TASP 1,3	Maximum distance from intersecting highway	5 miles	10 miles	10 miles	10 miles
Colleges Universities (Course work must consist predominately of on site classroom instruction)	Off street parking (Minimum)	500	400	200	100
	Maximum Distance from intersecting highway	3 miles	4 miles	5 miles	5 miles
Hospitals	See Service Signing Sections 2I-02 & 2I.03				
Recreational and Cultural Interest Areas 2	Facilities open to general public. Minimum annual attendance.	100,000 ³ (300,000) ⁴	50,000 ³ (250,000) ⁴	25,000 ³ (100,000) ⁴	10,000 ³ (50,000) ⁴
	Maximum distance from highway.	5 miles	5 miles	5 miles	5 miles
Government Facilities (Must be open for public access to receive service)	State or Federal. Maximum distance from highway	1/2 mile	1 mile	1 mile	2 miles
City/ Downtown Signing	See Sections 2E.41A & 2E.42	Eligible cities have the option of a "Downtown" sign or a "Next-Exits" sign.			
Parking, Park & Ride Terminal, and Rail Terminal Facilities	Facilities shall be directly related to the operation of a multimodal transportation system. This includes parking for carpooling, mass transit and rail terminal access. Max. distance from highway.	3 miles	3 miles	1 mile	1 mile
	Minimum number of parking spaces.	200	100	100	100

NOTES:

1. Listed as approved in the Texas Airport System Plan (TASP).
2. State and National Parks may be signed from the highway nearest the park regardless of annual attendance.
3. Applies to Conventional roads.
4. Applies to Freeways and Expressways.

Section 2M.05 Symbol Sign Sizes*Guidance:*

- 01 *Recreational and cultural interest area symbol signs should be 24 x 24 inches. Where greater visibility or emphasis is needed, larger sizes should be used. Symbol sign enlargements should be in 6-inch increments.*
- 02 *Recreational and cultural interest area symbol signs should **not** be used on guide signs on freeways or expressways.*

Option:

- 03 A smaller size of 18 x 18 inches may be used on low-speed, low-volume roadways and on non-road applications.

Option:

- 13 At an intersection with a high volume of left-turn traffic from the major street, the signal warrant analysis may be performed in a manner that considers the higher of the major-street left-turn volumes as the “minor-street” volume and the corresponding single direction of opposing traffic on the major street as the “major-street” volume.
- 14 For signal warrants requiring conditions to be present for a certain number of hours in order to be satisfied, any four sequential 15-minute periods may be considered as 1 hour if the separate 1-hour periods used in the warrant analysis do not overlap each other and both the major-street volume and the minor-street volume are for the same specific one-hour periods.
- 15 For signal warrant analysis, bicyclists may be counted as either vehicles or pedestrians.

Support:

- 16 When performing a signal warrant analysis, bicyclists riding in the street with other vehicular traffic are usually counted as vehicles and bicyclists who are clearly using pedestrian facilities are usually counted as pedestrians.

Option:

- 17 Engineering study data may include the following:
- A. The number of vehicles entering the intersection in each hour from each approach during 12 hours of an average day. It is desirable that the hours selected contain the greatest percentage of the 24-hour traffic volume.
 - B. Vehicular volumes for each traffic movement from each approach, classified by vehicle type (heavy trucks, passenger cars and light trucks, public-transit vehicles, and, in some locations, bicycles), during each 15-minute period of the 2 hours in the morning and 2 hours in the afternoon during which total traffic entering the intersection is greatest.
 - C. Pedestrian volume counts on each crosswalk during the same periods as the vehicular counts in Item B and during hours of highest pedestrian volume. Where young, elderly, and/or persons with physical or visual disabilities need special consideration, the pedestrians and their crossing times may be classified by general observation.
 - D. Information about nearby facilities and activity centers that serve the young, elderly, and/or persons with disabilities, including requests from persons with disabilities for accessible crossing improvements at the location under study. These persons might not be adequately reflected in the pedestrian volume count if the absence of a signal restrains their mobility.
 - E. The posted or statutory speed limit or the 85th-percentile speed on the uncontrolled approaches to the location.
 - F. A condition diagram showing details of the physical layout, including such features as intersection geometrics, channelization, grades, sight-distance restrictions, transit stops and routes, parking conditions, pavement markings, roadway lighting, driveways, nearby railroad crossings, distance to nearest traffic control signals, utility poles and fixtures, and adjacent land use.
 - G. A collision diagram showing crash experience by type, location, direction of movement, severity, weather, time of day, date, and day of week for at least 1 year.
- 18 The following data, which are desirable for a more precise understanding of the operation of the intersection, may be obtained during the periods described in Item B of Paragraph 17:
- A. Vehicle-hours of stopped time delay determined separately for each approach.
 - B. The number and distribution of acceptable gaps in vehicular traffic on the major street for entrance from the minor street.
 - C. The posted or statutory speed limit or the 85th-percentile speed on controlled approaches at a point near to the intersection but unaffected by the control.
 - D. Pedestrian delay time for at least two 30-minute peak pedestrian delay periods of an average weekday or like periods of a Saturday or Sunday.
 - E. Queue length on stop-controlled approaches.

Section 4C.02 Warrant 1, Eight-Hour Vehicular Volume

Support:

- 01 The Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.
- 02 The Interruption of Continuous Traffic, Condition B, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.
- 03 It is intended that Warrant 1 be treated as a single warrant. If Condition A is satisfied, then Warrant 1 is satisfied and analyses of Condition B and the combination of Conditions A and B are not needed. Similarly, if Condition B is satisfied, then Warrant 1 is satisfied and an analysis of the combination of Conditions A and B is not needed.

Standard:

04 The need for a traffic control signal shall be considered if an engineering study finds that one of the following conditions exist for each of any 8 hours of an average day:

- A. The vehicles per hour given in both of the 100 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; or
- B. The vehicles per hour given in both of the 100 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.

In applying each condition the major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these 8 hours.

Option:

05 If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 70 percent columns in Table 4C-1 may be used in place of the 100 percent columns.

Guidance:

06 The combination of Conditions A and B is intended for application at locations where Condition A is not satisfied and Condition B is not satisfied and should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Standard:

07 The need for a traffic control signal shall be considered if an engineering study finds that both of the following conditions exist for each of any 8 hours of an average day:

- A. The vehicles per hour given in both of the 80 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; and
- B. The vehicles per hour given in both of the 80 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.

These major-street and minor-street volumes shall be for the same 8 hours for each condition; however, the 8 hours satisfied in Condition A shall not be required to be the same 8 hours satisfied in Condition B. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

^a Basic minimum hourly volume

^b Used for combination of Conditions A and B after adequate trial of other remedial measures

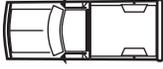
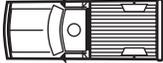
^c May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Table 6H-1. Index to Typical Applications

Typical Application Description	Typical Application Number
Work Outside of the Shoulder (see Section 6G.06)	
Work Beyond the Shoulder	TA-1
Blasting Zone	TA-2
Work on the Shoulder (see Sections 6G.07 and 6G.08)	
Work on the Shoulders	TA-3
Short Duration or Mobile Operation on a Shoulder	TA-4
Shoulder Closure on a Freeway	TA-5
Shoulder Work with Minor Encroachment	TA-6
Work Within the Traveled Way of a Two-Lane Highway (see Section 6G.10)	
Road Closed with a Diversion	TA-7
Roads Closed with an Off-Site Detour	TA-8
Overlapping Routes with a Detour	TA-9
Lane Closure on a Two-Lane Road Using Flaggers	TA-10
Lane Closure on a Two-Lane Road with Low Traffic Volumes	TA-11
Lane Closure on a Two-Lane Road Using Traffic Control Signals	TA-12
Temporary Road Closure	TA-13
Haul Road Crossing	TA-14
Work in the Center of a Road with Low Traffic Volumes	TA-15
Surveying Along the Center Line of a Road with Low Traffic Volumes	TA-16
Mobile Operations on a Two-Lane Road	TA-17
Work Within the Traveled Way of an Urban Street (see Section 6G.11)	
Lane Closure on a Minor Street	TA-18
Detour for One Travel Direction	TA-19
Detour for a Closed Street	TA-20
Work Within the Traveled Way at an Intersection and on Sidewalks (see Section 6G.13)	
Lane Closure on the Near Side of an Intersection	TA-21
Right-Hand Lane Closure on the Far Side of an Intersection	TA-22
Left-Hand Lane Closure on the Far Side of an Intersection	TA-23
Half Road Closure on the Far Side of an Intersection	TA-24
Multiple Lane Closures at an Intersection	TA-25
Closure in the Center of an Intersection	TA-26
Closure at the Side of an Intersection	TA-27
Sidewalk Detour or Diversion	TA-28
Crosswalk Closures and Pedestrian Detours	TA-29
Work Within the Traveled Way of a Multi-Lane, Non-Access Controlled Highway (see Section 6G.12)	
Interior Lane Closure on a Multi-Lane Street	TA-30
Lane Closure on a Street with Uneven Directional Volumes	TA-31
Half Road Closure on a Multi-Lane, High-Speed Highway	TA-32
Stationary Lane Closure on a Divided Highway	TA-33
Lane Closure with a Temporary Traffic Barrier	TA-34
Mobile Operation on a Multi-Lane Road	TA-35
Work Within the Traveled Way of a Freeway or Expressway (see Section 6G.14)	
Lane Shift on a Freeway	TA-36
Double Lane Closure on a Freeway	TA-37
Median Crossover on a Freeway	TA-39
Median Crossover for an Entrance Ramp	TA-40
Median Crossover for an Exit Ramp	TA-41
Work in the Vicinity of an Exit Ramp	TA-42
Partial Exit Ramp Closure	TA-43
Work in the Vicinity of an Entrance Ramp	TA-44
Temporary Reversible Lane Using Movable Barriers	TA-45
Work in the Vicinity of a Grade Crossing (see Section 6G.18)	
Work in the Vicinity of a Grade Crossing	TA-46

Table 6H-2. Meaning of Symbols on Typical Application Diagrams

	Arrow board		Shadow vehicle
	Arrow board support or trailer (shown facing down)		Sign (shown facing left)
	Changeable message sign or support trailer		Surveyor
	Channelizing device		Temporary barrier
	Crash cushion		Temporary barrier with warning light
	Direction of temporary traffic detour		Traffic or pedestrian signal
	Direction of traffic		Truck-mounted attenuator
	Flagger		Type 3 barricade
	High-level warning device (Flag tree)		Warning light
	Longitudinal channelizing device		Work space
	Luminaire		Work vehicle
	Pavement markings that should be removed for a long-term project		