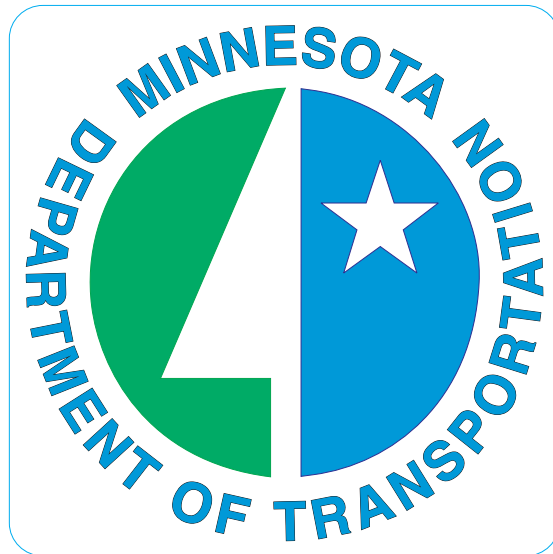


No Passing Zone Workbook



**Minnesota Department of Transportation
Office of Traffic, Safety, and Technology**

www.dot.state.mn.us/OTSO

June, 2008

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Introduction

This workbook is designed to enable the participants to obtain an understanding of the fundamental MN MUTCD concepts and Mn/DOT standard practices related to establishing No Passing Zones. This workbook will cover numerous changes made to the Traffic Engineering Manual Chapter 7, version 2008, including a new process for determining the length of No Passing Zones at sight obstructions, school crosswalks, stop signs, roundabouts and RR crossings. All figures are taken from the 2005 MN MUTCD, with its latest updates, or the 2008 Traffic Engineering Manual Chapter 7.

Minnesota State Statutes

169.18 DRIVING RULES.

Subdivision 3. **Passing.** The following rules shall govern the overtaking and passing of vehicles proceeding in the same direction, subject to the limitations, exceptions, and special rules hereinafter stated:

- (1) the driver of a vehicle overtaking another vehicle proceeding in the same direction shall pass to the left thereof at a safe distance and shall not again drive to the right side of the roadway until safely clear of the overtaken vehicle;
- (2) except when overtaking and passing on the right is permitted, the driver of an overtaken vehicle shall give way to the right in favor of the overtaking vehicle on audible warning, and shall not increase the speed of the overtaken vehicle until completely passed by the overtaking vehicle; and
- (3) the operator of a motor vehicle overtaking a bicycle or individual proceeding in the same direction on the roadway shall leave a safe distance, but in no case less than three feet clearance, when passing the bicycle or individual and shall maintain clearance until safely past the overtaken bicycle or individual.

Subd. 4. **Passing on the right.** The driver of a vehicle may overtake and pass upon the right of another vehicle only upon the following conditions:

- (1) when the vehicle overtaken is making or about to make a left turn;
- (2) upon a street or highway with unobstructed pavement not occupied by parked vehicles of sufficient width for two or more lines of moving vehicles in each direction;
- (3) upon a one-way street, or upon any roadway on which traffic is restricted to one direction of movement, where the roadway is free from obstructions and of sufficient width for two or more lines of moving vehicles;
- (4) when the driver of a vehicle may overtake and pass another vehicle upon the right only under conditions permitting such movement in safety. In no event shall such movement be made by driving onto the shoulder, whether paved or unpaved, or off the pavement or main-traveled portion of the roadway.

Subd. 5. **Driving left of roadway center; exception.**

(a) No vehicle shall be driven to the left side of the center of the roadway in overtaking and passing another vehicle proceeding in the same direction unless such left side is clearly visible and is free of oncoming traffic for a sufficient distance ahead to permit such overtaking and passing to be completely made without interfering with the safe operation of any vehicle approaching from the opposite direction or any vehicle overtaken. In every event the overtaking vehicle must return to the right-hand side of the roadway before coming within 100 feet of any vehicle approaching from the opposite direction.

(b) Except on a one-way roadway or as provided in paragraph

(c), no vehicle shall, in overtaking and passing another vehicle or at any other time, be driven to the left

half of the roadway under the following conditions:

- (1) when approaching the crest of a grade or upon a curve in the highway where the driver's view along the highway is obstructed within a distance of 700 feet;
- (2) when approaching within 100 feet of any underpass or tunnel, railroad grade crossing, intersection within a city, or intersection outside of a city if the presence of the intersection is marked by warning signs; or
- (3) where official signs are in place prohibiting passing, or a distinctive centerline is marked, which distinctive line also so prohibits passing, as declared in the Manual on Uniform Traffic Control Devices adopted by the commissioner.

(c) Paragraph (b) does not apply to a self-propelled or towed implement of husbandry that

- (1) is escorted at the front by a registered motor vehicle that is displaying vehicular hazard warning lights visible to the front and rear in normal sunlight, and
- (2) does not extend into the left half of the roadway to any greater extent than made necessary by the total width of the right half of the roadway together with any adjacent shoulder that is suitable for travel.

(d) Paragraph (b) does not apply to a self-propelled or towed implement of husbandry that is operated to the left half of the roadway if such operation is not to a greater extent than is necessary to avoid collision with a parked vehicle, sign, or other stationary object located on the highway right-of-way.

Mn/DOT Traffic Engineering Manual

7-4.04 No-Passing Zone Surveys

7-4.04.01 *Warrants*

A no-passing zone is warranted when the minimum sight distance is less than the distances shown in Chart 7-3. No-passing zone surveys shall be run at an eye height of 3.5 feet to an object height of 3.5 feet at the sight distance required in Chart 7-3 based upon the 85th percentile speed. The beginning of a no-passing zone shall be the point at which the sight distance first becomes less than that specified in Chart 7-3. The end of the marking shall be that point at which the sight distance becomes greater than the minimum specified in Chart 7-3. A no-passing line should not be less than 500 feet in length unless in advance of a stop sign as specified in Chart 7-2 or as specified in a specific figure. If the end of a no-passing line is less than that specified in Chart 7-4 from the beginning of the line for the next no-passing zone, the two no-passing lines should be connected to provide a continuous restriction through both zones.

If a re-survey of an existing no-passing zone is done and it changes in length, the NO PASSING ZONE pennant does not have to be relocated if the new termini is within 100 feet of the sign.

7-4.04.02 *Survey Procedures*

The first step in any surveying operation is work zone traffic control. Typically, the work zone traffic control for executing a no passing zone survey is considered a mobile operation. For the methods described below, this implies that workers are not typically stopped on the road for more than 15 minutes and the traffic control devices are vehicle mounted. MN MUTCD, Section 6K, (the Field Manual) Layout 5 would be a typical minimum treatment. Layout 2 would be a higher level of treatment if the road has challenging geometry. Ideally, surveys can be scheduled for the lowest volume periods. Higher ADT volumes, narrow shoulders or intense geometric changes may require additional measures all the way from advance road signs, shadow vehicles or all the way up to lane closures to protect survey workers and the motoring public. These impacts should be assessed and appropriate work zone treatments scheduled to coincide with the no passing zone survey.

There are several methods for surveying no-passing zones and a complete discussion of all those methods is found in the ITE Traffic Control Handbook (2001). An efficient and accurate method is the two vehicle method with both vehicles being equipped with electronic distance measuring instruments and handheld two way radios. In addition, the operators should have optical range finders and height-of-eye sight paddles. This will allow the survey operators the ability to accurately layout no passing zone surveys for both directions with one drive thru on roadways with simple geometry. Range finders will facilitate minimum time on the road determining distances. Ideally, no passing zones are established to an accuracy of 50 feet (approximately one painted skip stripe).

This method requires two vehicles equipped with two-way radios, calibrated distance measuring instruments (DMI), flashing amber lights, and a target for eye height on the lead vehicle. Operators should also have height-of-eye paddles to assist them in unusual geometry. Intermediate sedan size vehicles will work the best but at least the trailing vehicle should be an intermediate sedan with a drivers eye height near the 3.5 foot mark. Verify tire pressure since the DMI's are calibrated at correct tire pressure. Handheld radios will permit the drivers to communicate if they get out of the car to verify distances with the rangefinder. The target should be mounted so the top of the target is at 3.5 feet and should be a bright

	Speed Limit (or 85th Percentile) MPH	Minimum Length	
		Feet	Yards
	0 - 30	300	100
	40 - 50	400	133
	55 or greater	500	167

Text Ref.: 7-4.04.01

May 15, 2008	MINIMUM LENGTH OF A NO PASSING ZONE IN ADVANCE OF A STOP CONDITION	CHART 7-2
--------------	---	---------------------

	85th Percentile Speed MPH	Minimum Sight Distance	
		Feet	Yards
	30 or less	500	167
	31-40	600	200
	41-50	800	267
	51-60	1,000	333
	61 or greater	1,100	367

Text Ref.: 7-4.04.01

May 15, 2008	MINIMUM PASSING SIGHT DISTANCE	CHART 7-3
--------------	---------------------------------------	---------------------

	85th Percentile Speed MPH	Distance Between Zones	
		Feet	Yards
	20-39	500	167
	40-54	650	217
	55 and above	800	267

If the distance between zones is less than specified,
the zones should be connected.

Text Ref.: 7-4.04.01

May 15, 2008	MINIMUM DISTANCE OR GAP BETWEEN NO PASSING ZONES	CHART 7-4
--------------	---	---------------------

color different than the vehicle so that a sharp cut off can be observed from 1000 feet. Typically the target should be mounted on the driver's side of the rear of the vehicle. A 4-inch 12 volt LED light from an arrow board can also be a good target but do not use white lights since law prohibits bright white lights projecting from the rear of a vehicle while traveling.

To set the minimum sight distance interval, both cars should park abreast on the roadway or shoulder and the DMI's set at 0.000. The lead vehicle will then move forward the minimum passing sight distance for the speed indicated. When the lead vehicle has gone the required distance, it should stop and the DMI should be reset to 0.000. Not all DMI's have the capability to work in reverse so verify the operation of the particular DMI used. Newer DMI's have GPS capability and can have read outs for the distance between them. The vehicles with drivers are deployed with the appropriate minimum sight distance between them.

From then on, radio contact should be maintained between the vehicles to coordinate their movement. Upon a signal from the trailing vehicle, both vehicles can move forward. The vehicles are to be kept at the correct distance and speed by the lead vehicle observer calling off feet often enough to keep identical readings on the DMI's. To practice this procedure, readings should be called off every 100 feet with the vehicles traveling approximately at 5 mph. Later with added experience, this speed may be increased. If identical readings cannot be maintained, the trailing vehicle should have a lower reading. This will result in the vehicles being farther apart than required. One note of caution, the vehicles should not be backed up to adjust the spacing, unless the DMI's being used are capable of operating backwards.

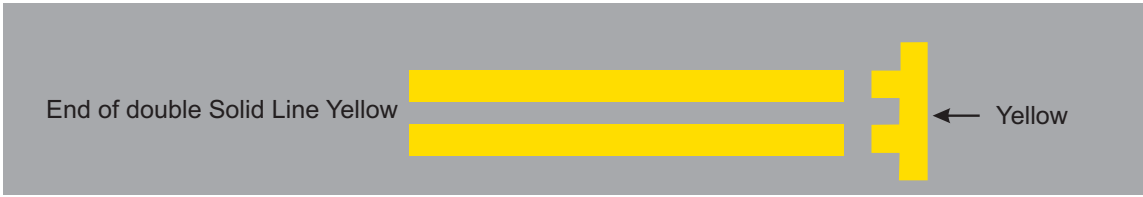
Most vertical curves can be done from the shoulder. Horizontal curves should be sighted from near the centerline. Given the slow vehicle pace necessary to conduct this study, care must be taken when locating no passing zones to see that traffic does not become confused or congested. Both vehicles should pull over on the shoulder when the rear driver notices cars being held back.

While making measurements, the driver of the trailing vehicle should stop both vehicles just before the lead vehicle goes out of sight. At this time, the trailing vehicle can move up to obtain identical DMI readings. From this point each vehicle will move forward 50 feet, stop, then move another 50 feet until the target on the lead vehicle goes out of sight over the crest of a hill or is obscured by obstructions along the roadside on horizontal curves. With practice, a team may be able to move continuously and stop only when the lead vehicle goes out of sight. When the lead vehicle's target disappears, the pavement should be marked with spray paint or by some other method.

The trailing vehicle operator should mark to the right of the centerline and the leading vehicle to the left. The trailing vehicle marks will represent the beginning and end of the no-passing zone for vehicles traveling in the direction of the study.

The lead vehicle marks will represent the no passing zone for the opposite direction of travel. See Figure 7.18 for spotting symbols.

The two vehicles should then proceed forward with identical DMI readings until the driver of the trailing vehicle sees the top of the lead vehicle. Both vehicles are stopped and the trailing vehicle is moved forward to obtain identical DMI readings. Then both vehicles should move forward 50 feet, and stop to determine if the target has re-appeared. This "stepping" is repeated until the target re-appears. Both drivers should then stop and mark the roadway. The lead driver marks on the left of the centerline and the trailing driver marks on the right of the centerline. See Sketch 1 and Figure 7-16.

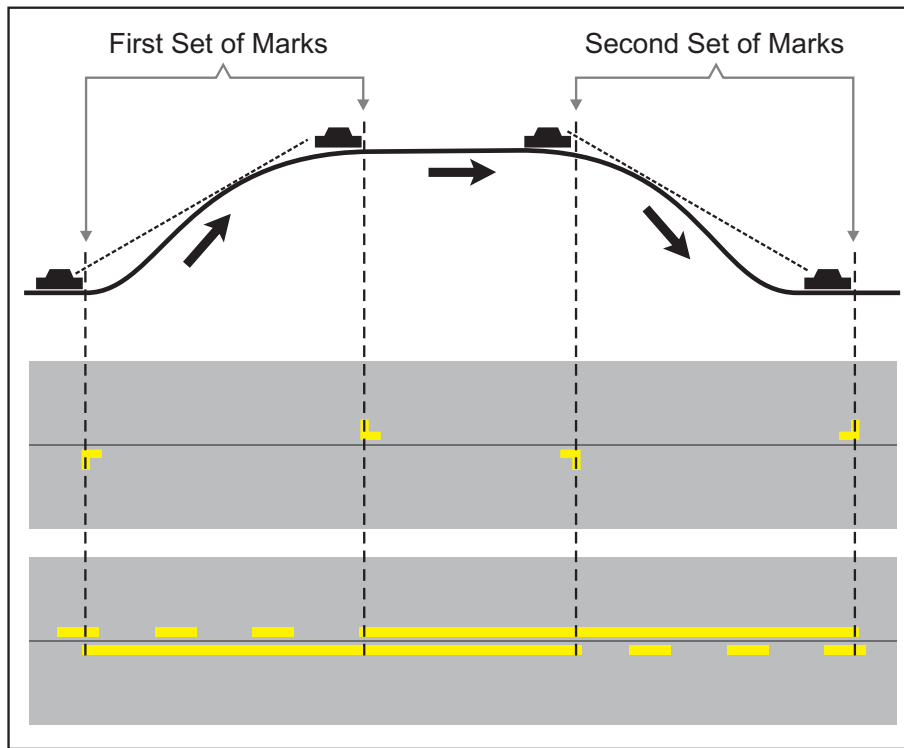


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May 15, 2008

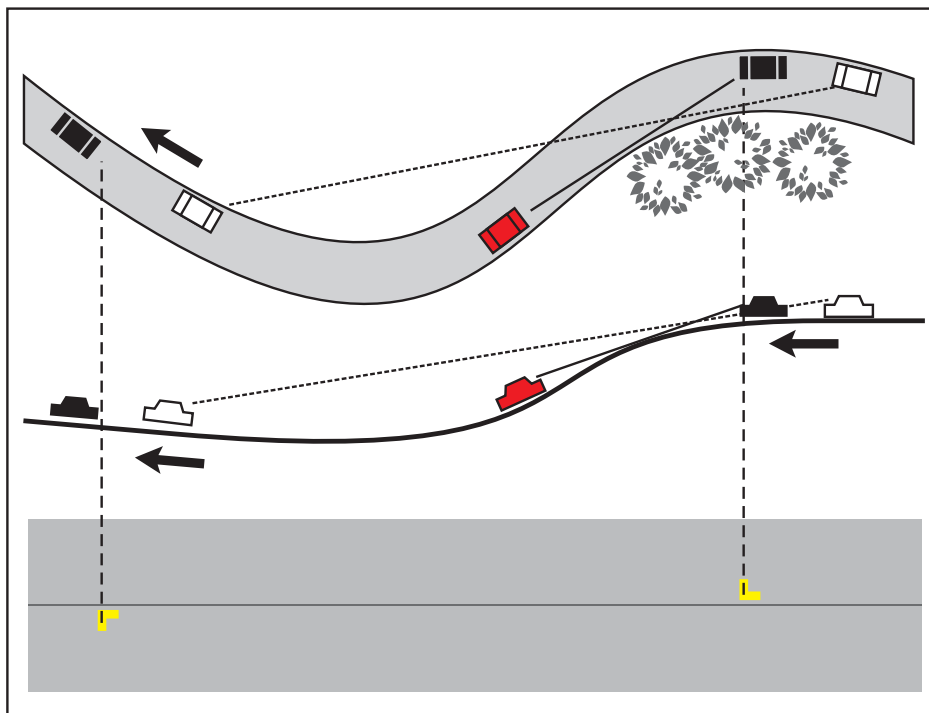
SPOTTING SYMBOLS FOR PAVEMENT STRIPING

**FIGURE
7.18**



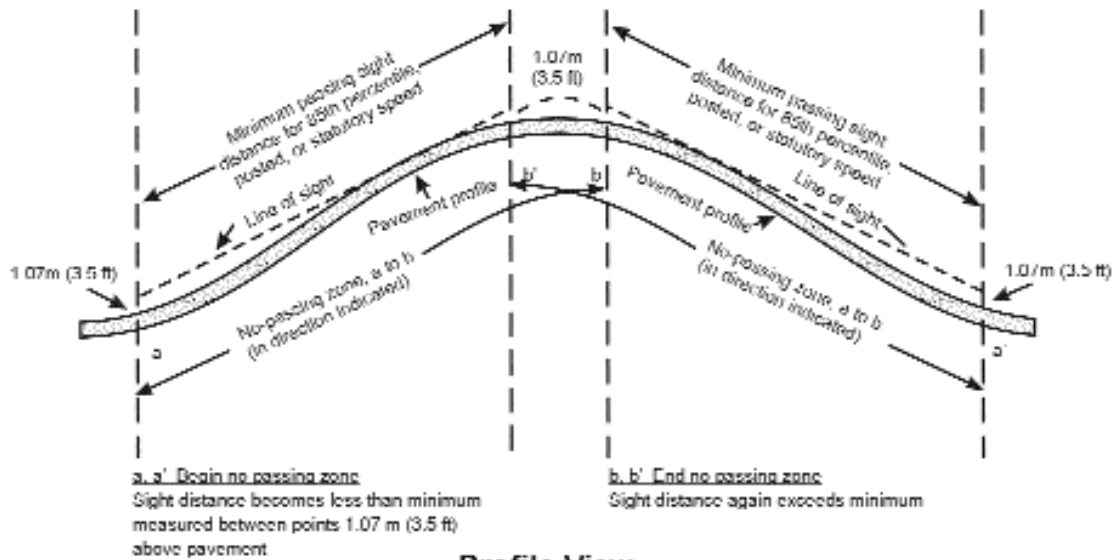
Sketch 1 - Establishing Marks for Identifying No Passing Zone Locations

It is possible for vehicles positioned in-between the study vehicles to become lost in depressions although the vehicles are spaced the minimum sight distance apart and the drivers may see each other. Reverse horizontal curves can create similar situations. See Sketch 2.



Sketch 2 - How Obstructions and Depressions Cause Vehicle to Become "Lost"

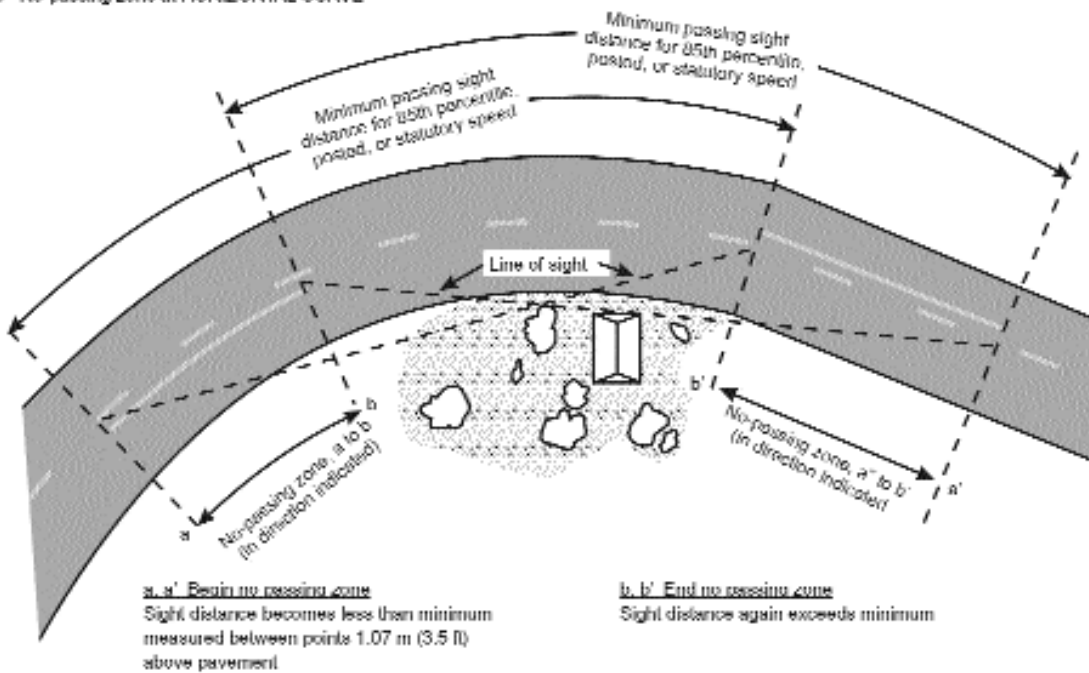
a - No passing zone at VERTICAL CURVE



Profile View

NOTE: No-passing zones in opposite directions may or may not overlap, depending on alignment.

b - No-passing zone at HORIZONTAL CURVE



Plan View

NOTE: No-passing zones in opposite directions may or may not overlap, depending on alignment.

Text Ref.: 7-4.04.02

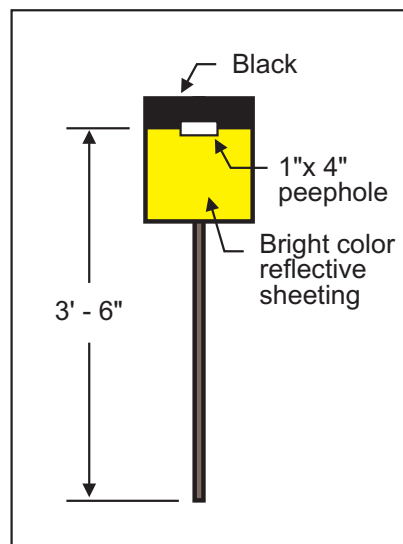
May 15, 2008

NO PASSING ZONE PROFILES

FIGURE
7.16

The following procedure is suggested for handling these lost vehicle situations. The driver of the lead vehicle estimates where the low point of a depression is and stops there, after notifying the trailing vehicle of what process is being performed. The trailing vehicle then moves forward until the target on the lead vehicle is in sight. If it is noted by the trailing driver that other on-coming vehicles continue to become lost, the trailing vehicle must move forward to a point where the driver does not lose an on-coming car in the depressions. At this point, a spot should be marked to the right of the centerline by the trailing vehicle's driver. With the trailing vehicle stopped, the lead vehicle then moves forward so it has a DMI reading identical to the trailing vehicle and marks a spot to the left of the centerline. The two vehicles are now synchronized and may proceed with the study. If traffic volumes are high enough, the trailing vehicle can use oncoming cars to spot depressions and sight in on both headlights instead of the target on the lead vehicle. The trailing driver would then radio this reading to the lead driver to re-synchronize the vehicles.

Horizontal curves can be more challenging. Ideally, sight lines should be made from the wheel path nearest the centerline or on the centerline. Drivers may have to exit their vehicles and use the height-of-eye paddles (See Sketch 3). Multiple horizontal curves in a row or compound curves will probably have to be driven in both directions to verify accurate placement.



Sketch 3 - Height-of-Eye Paddle

The minimum passing sight distance used during the study should be changed to accommodate changes in the speed limit. This may require changing passing sight distances while in a no passing zone. If there is any doubt, the longer of the two distances should be used. It is advisable to drive these situations in both directions to confirm placement.

Range finders will help in determining if zones should be connected. If at the end of a potential zone, the trailing operator sees a stop sign ahead, the operator can target the stop sign and get a reading. If that reading is less than the distance in Chart 7-2 plus the gap distance shown in Chart 7-4, then a mark should not be made at the end of the zone until reaching the intersection. Similar range finding techniques can be used to assist in placement of zones in advance of bridges, RR crossings, and medians. The use of temporary pavement tape for spotting marks can also be a time saver in challenging alignment where many gaps need to be connected. The tape can be easily pulled off the pavement without scarring or causing black paint erasure marks.

Before final no-passing zones are marked on the pavement, minor adjustments may be made to survey data so that the marking of sight restrictions of short duration are either extended to 500 feet (0.095 mile) or disregarded altogether. If extended, the addition shall be made to the beginning of the zone. Before a sight restriction of less than 500 feet is either installed or disregarded, close field examination shall be made, checking to see if the target is completely out of sight for approximately 2 seconds at the prevailing speed. If the target vehicle does not go completely out of sight, the no-passing zone may be disregarded.

Sound judgment must be exercised by the No-Passing Zone crew leader, taking into consideration distance traveled and time elapsed during the sight restriction and weighing these factors against the time which both drivers have to observe each other prior to reaching the sight obstruction. If doubt exists, the no-passing zone should be marked to a minimum of 500 feet.

Chart 7-1 shows a typical form that may be used to log the placement and type of no passing zones. This form is available in an excel spreadsheet from the OTST Pavement Marking Engineer.

7-4.04.03 Removal of Sight Obstructions

When minor maintenance activity can be performed to remove sight obstructions, a request explaining the obstruction shall be sent to the appropriate Maintenance Area for action. Requests for removal(s) of sight obstructions shall normally be limited to work needed to avoid extending a no passing zone.

6-6.12 No Passing Zones

6-6.12.01 NO PASSING ZONE Sign (W14-3)

NO PASSING ZONE signs used on conventional highways shall be 48" x 60" x 60".

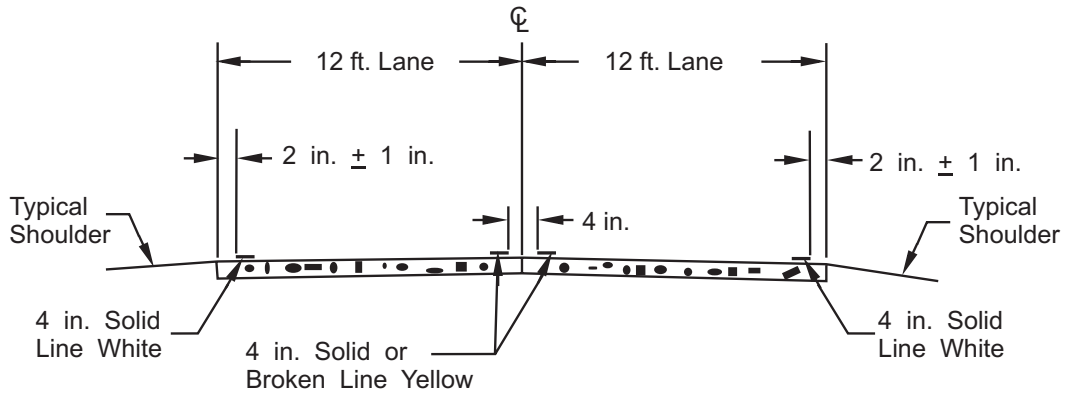
The purpose of this larger size on conventional highways is to provide added visibility of the sign for motorists.



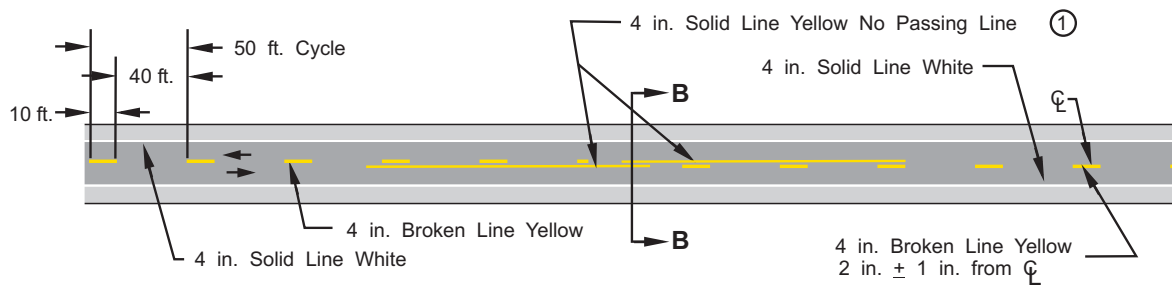
6-6.12.02 Terminal Marker Posts

A yellow post may be used to mark each terminal end of a No Passing Zone. A yellow 360 degree visibility enhancer (or equivalent) shall be mounted on the top of each marker post.

A 3-1/2" x 2" sticker stating "Mn/DOT NO PASSING ZONE TERMINAL MARKER" shall be installed near the top of each visibility enhancer so that the sticker is visible from the roadway. The stickers are available from the state sign shop in Oakdale.



SECTION B-B
(24 ft. roadway)



① Contact traffic engineer for No Passing Survey

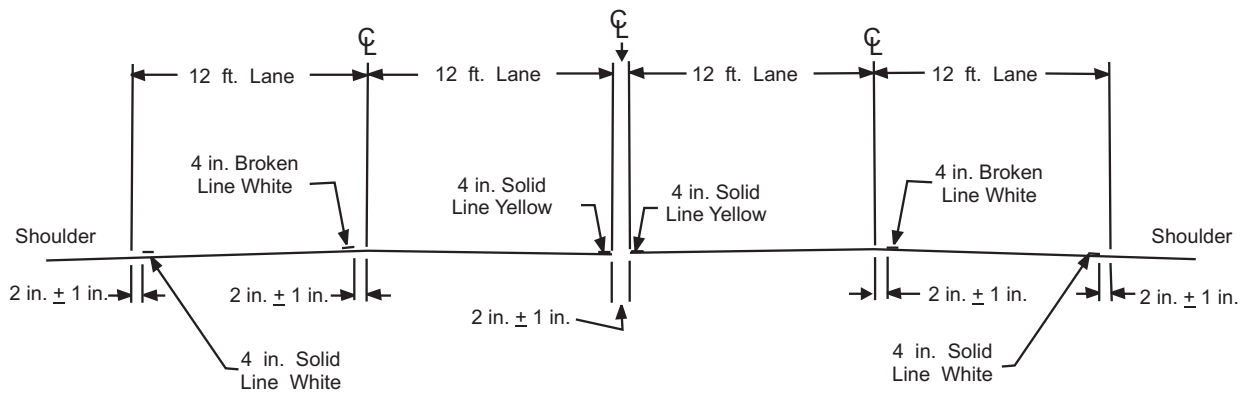
NOTE: Do not place longitudinal pavement marking lines on the roadway joints.

Text Ref.: 7-4.03.01

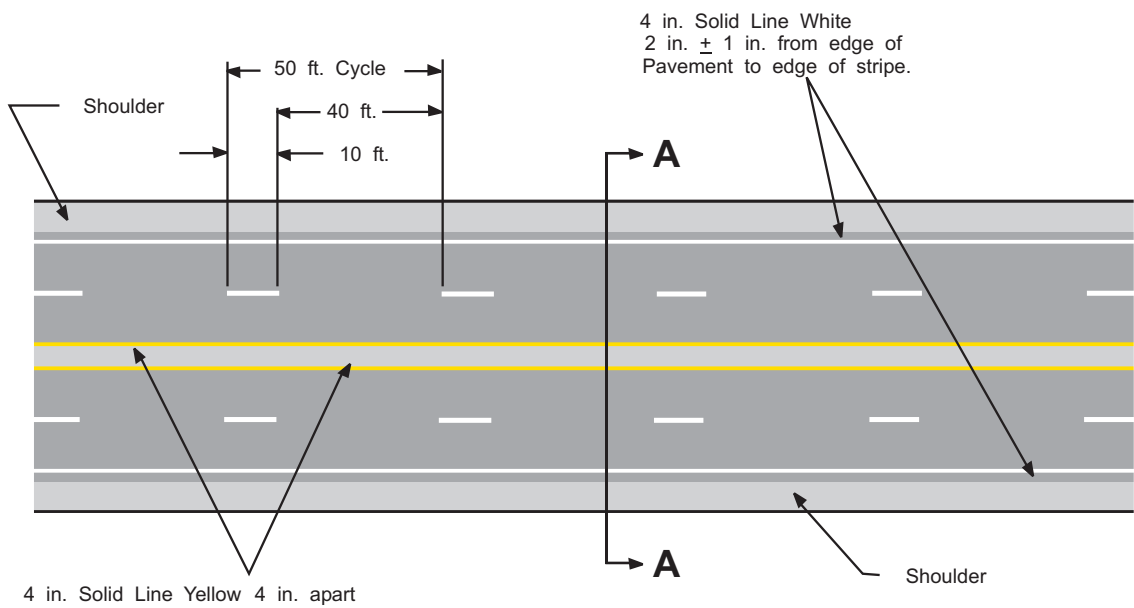
May 15, 2008

**TWO-LANE, TWO-WAY ROADWAY
PAVEMENT MARKING DETAILS**

**FIGURE
7.1**



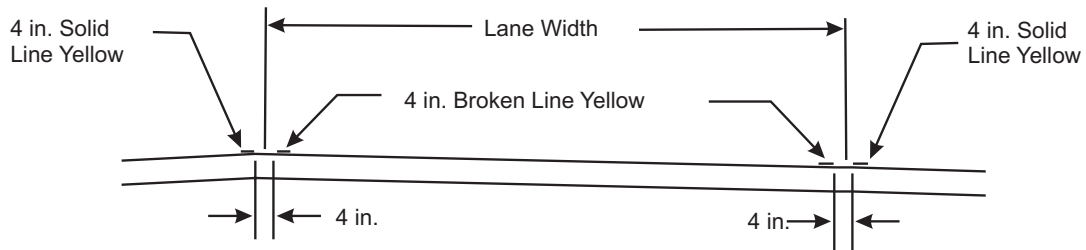
SECTION A-A



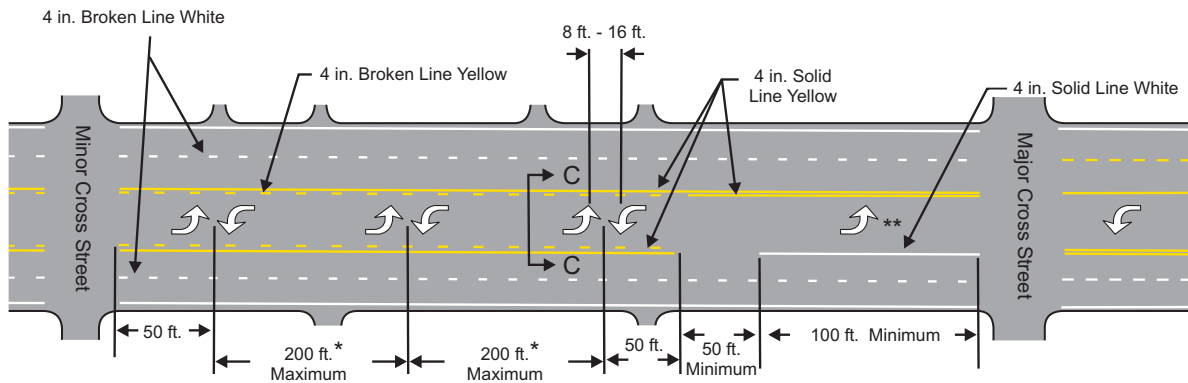
NOTE: Do not place longitudinal Pavement Marking Lines on the roadway joints.

Text Ref.: 7-4.03.02

May 15, 2008	MULTI-LANE UNDIVIDED ROADWAY PAVEMENT MARKING DETAILS	FIGURE 7.2
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SECTION C-C



* These distances should be equal. The Pavement Arrows are placed to show the operation and do not have to line up with any of the driveways.

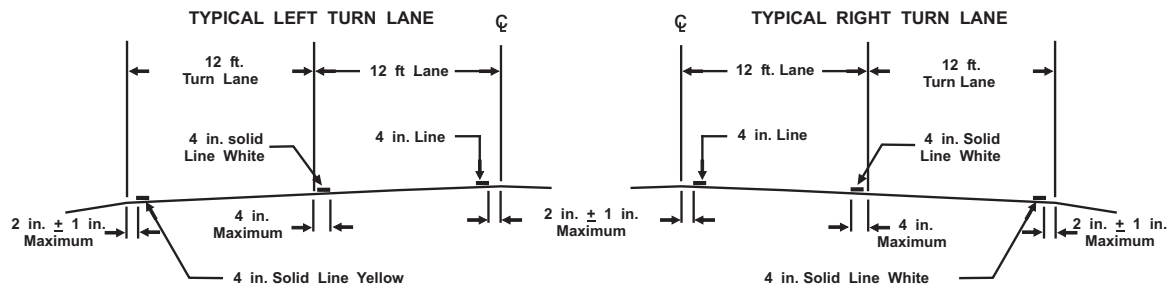
** See "TYPICAL MESSAGE PLACEMENT FOR TURN LANES" for the number and placement of turn arrows and how to introduce this lane -- Figure 7.9

Text Ref.: 7-4.03.03

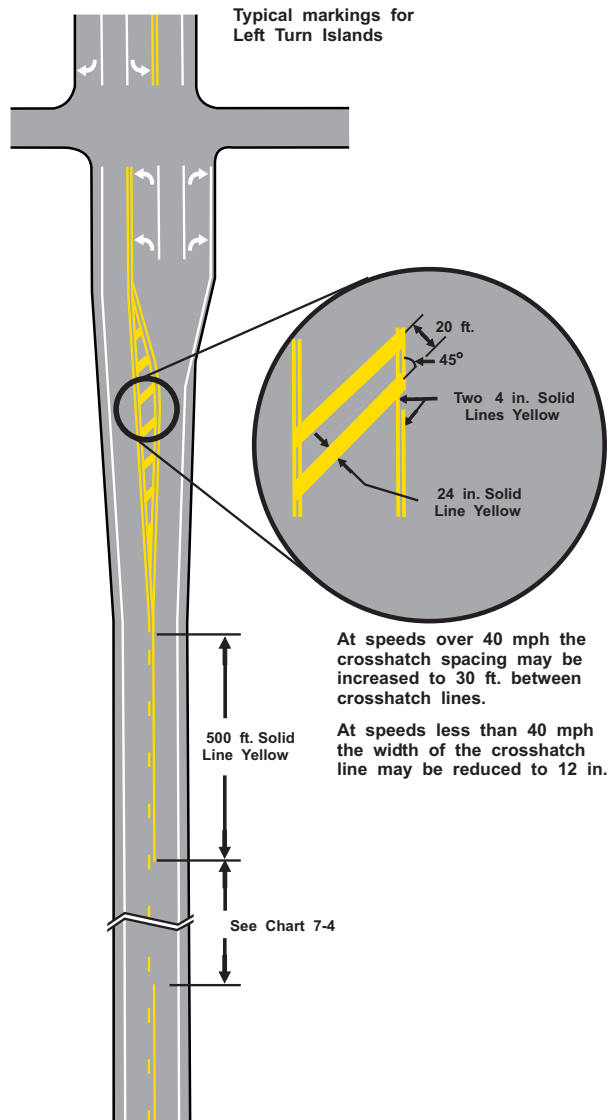
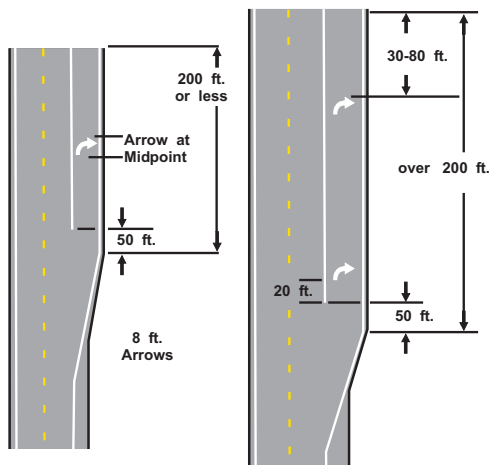
May 15, 2008

**TWO-WAY LEFT TURN LANE
PAVEMENT MARKING DETAILS**

**FIGURE
7.3**



TYPICAL MESSAGE PLACEMENT FOR TURN LANES

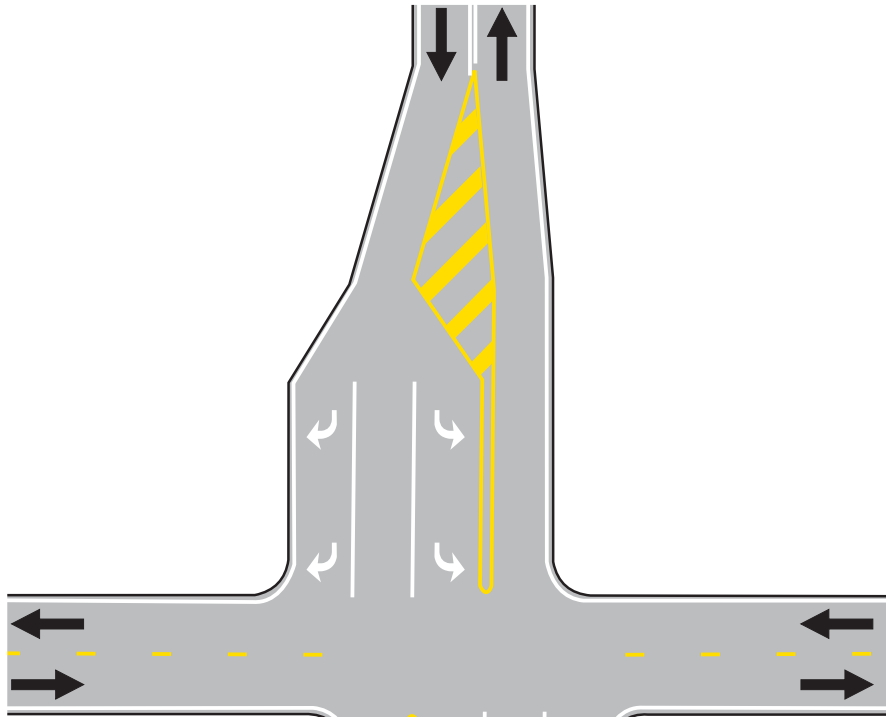


Text Ref.: 7-4.03.09

May 15, 2008

TURN LANE AND LEFT TURN ISLAND PAVEMENT MARKINGS

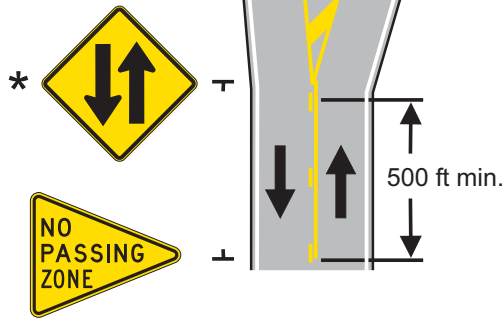
FIGURE 7.9



NOTE:

1. The signing is the same for both approaches to the intersection.
2. See Chapter 7 for application of markings.

* - Optional



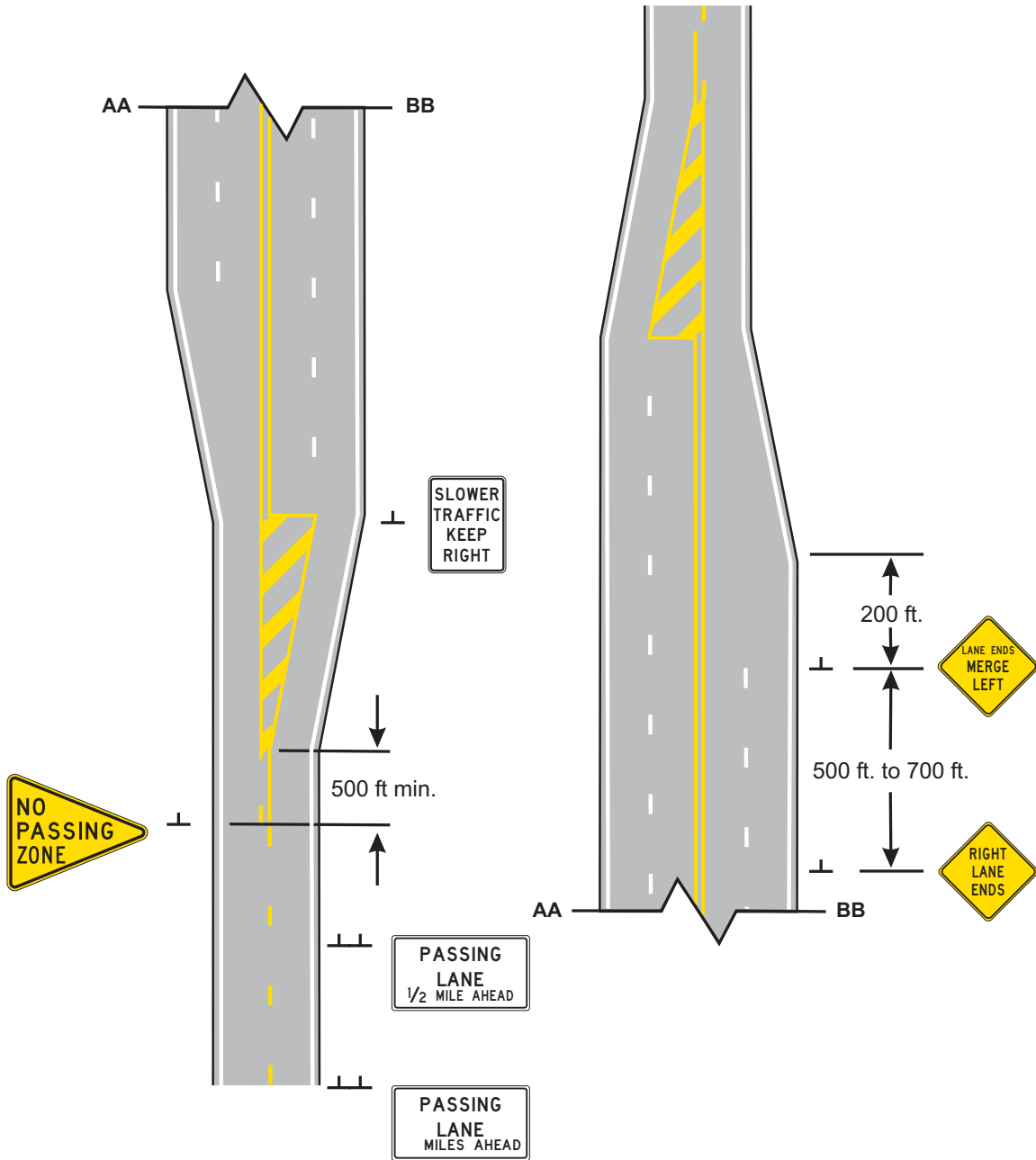
RIGHT LANE
MUST
TURN RIGHT *

ONLY ONLY ONLY

March 1, 2008

**CHANNELIZED INTERSECTION SIGNING
PAINTED MEDIAN**

**FIGURE
6.20B**



See Note 2

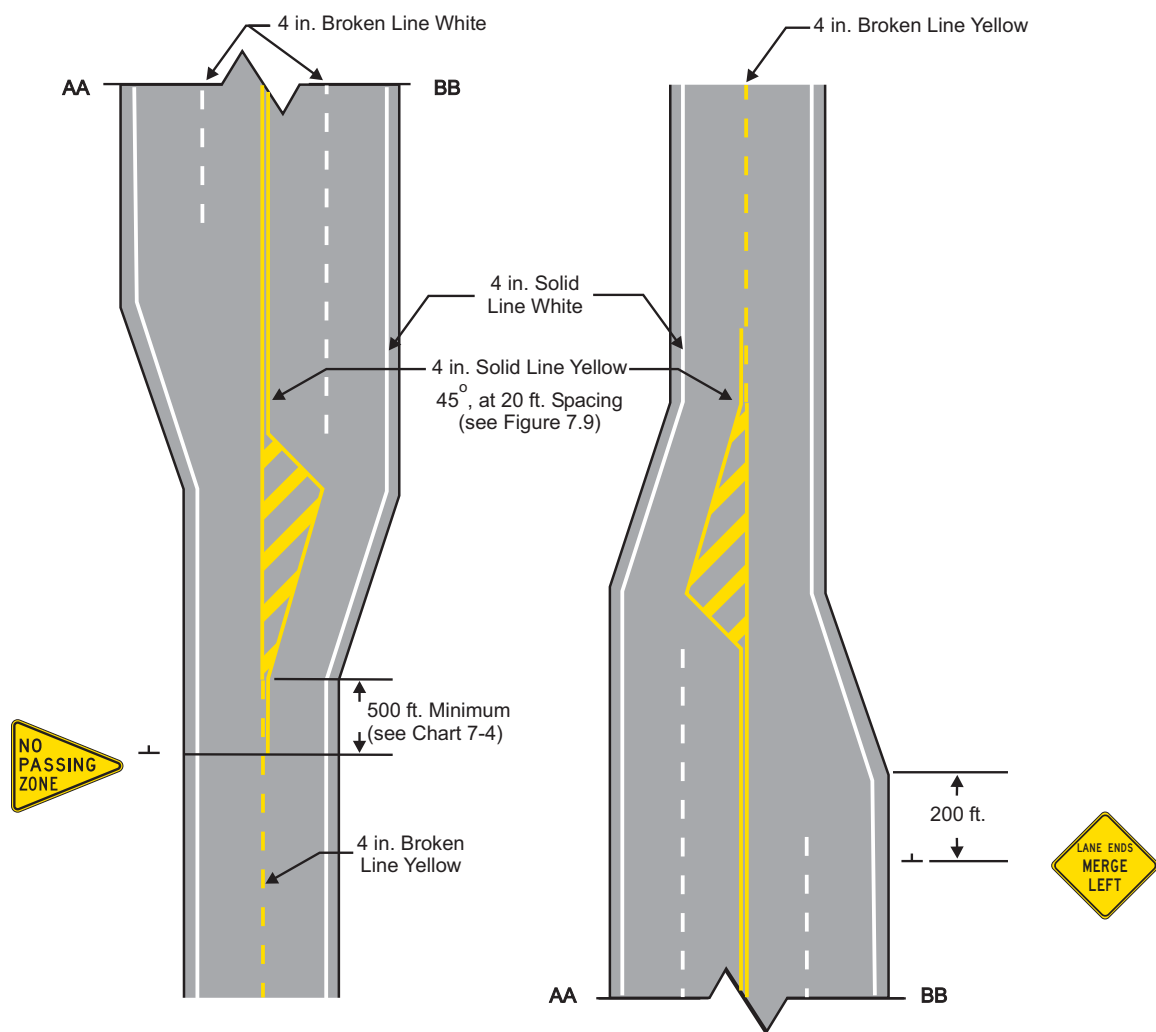
NOTES:

1. Use the same treatment for both approaches.
2. Desirable location 2 - 5 miles in advance of passing lane.
3. Lane skip striping shall end approximately 50 feet beyond the Lane Reduction Transition sign.
4. See Chapter 7 for application of markings.

March 1, 2008

PASSING LANE SECTION SIGNING

FIGURE
6.22A



NOTE:

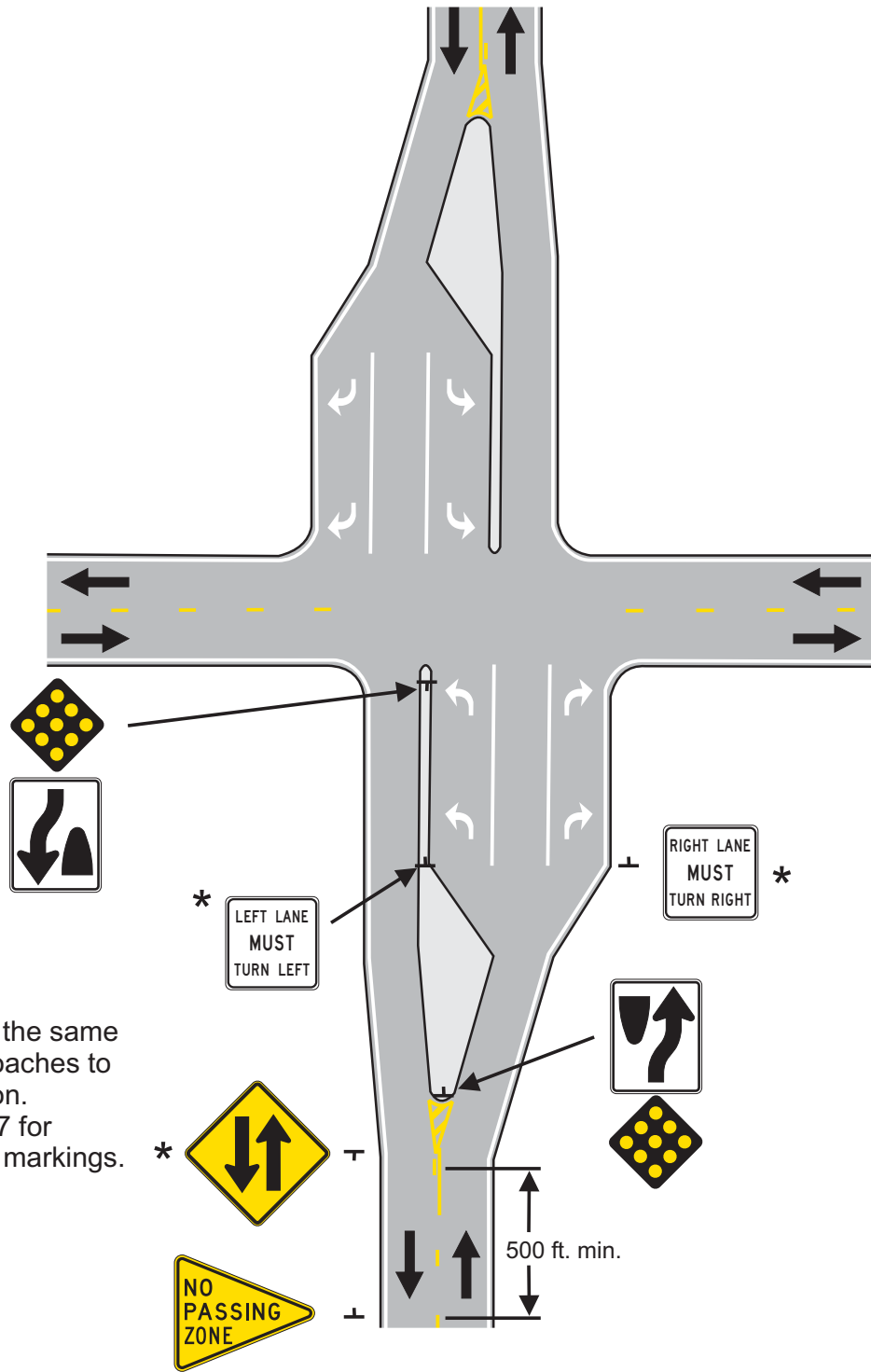
1. The same treatment is used for both approaches.
2. The lane skip striping shall end approximately 50 feet beyond the Lane Reduction sign.
3. More details on signing can be found in Chapter 6.

Text Ref.: 7-4.03.01 (2a)

May 15, 2008

PASSING LANE SECTION PAVEMENT MARKINGS

**FIGURE
7.4**



NOTES:

1. The signing is the same for both approaches to the intersection.
2. See Chapter 7 for application of markings.

* - Optional

March 1, 2008

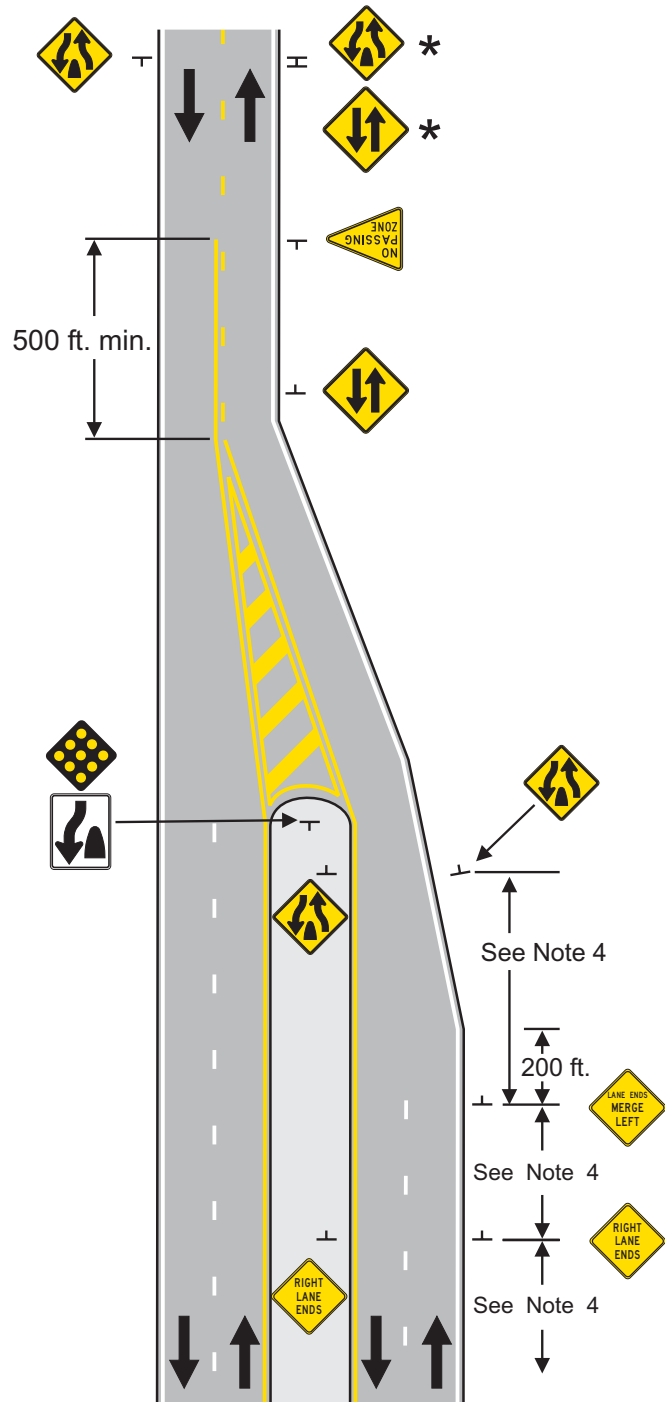
**CHANNELIZED INTERSECTION SIGNING
RAISED MEDIAN**

**FIGURE
6.20A**

NOTES:

1. All sign location distances are approximate.
2. Distances between advance signs in the two-lane, two-way section to the painted gore are 500-1200 feet.
3. See Chapter 7 for application of markings.
4. On high speed roadways (45 mph and greater), the spacing should be 400-500 feet. On low speed roadways (40 mph and less), the spacing should be 200-400 feet.
5. Do not use Divided Highway Begins and Divided Highway Ends signs when the highway is divided only at intersections or junctions.

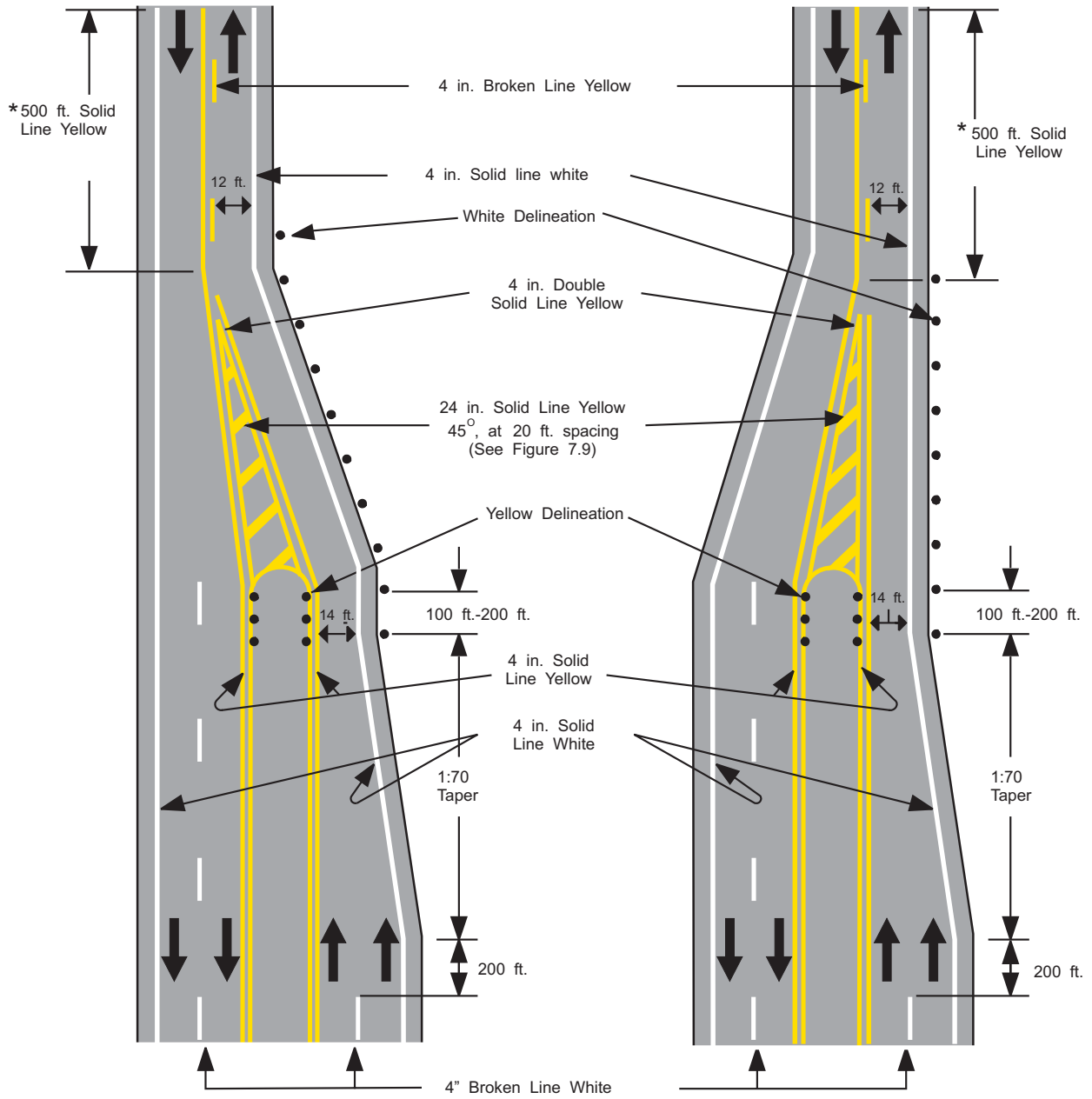
* - Optional



March 1, 2008

TRANSITION SIGNING
DIVIDED AND UNDIVIDED ROADWAYS

FIGURE
6.23



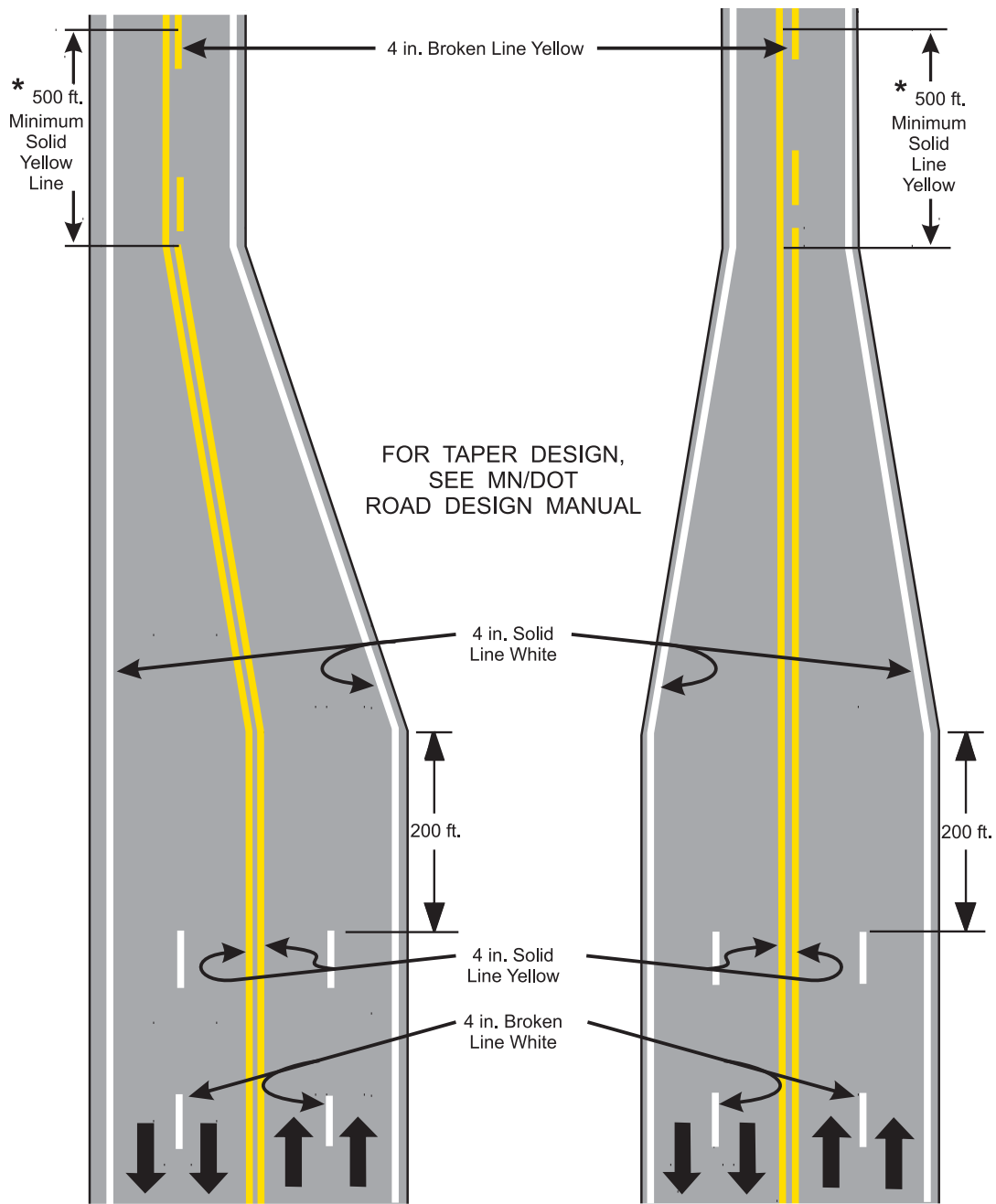
* See Chart 7-4.

Text Ref.: 7-4.03.12

May 15, 2008

**DIVIDED ROADWAY TRANSITION
PAVEMENT MARKINGS**

**FIGURE
7.11**



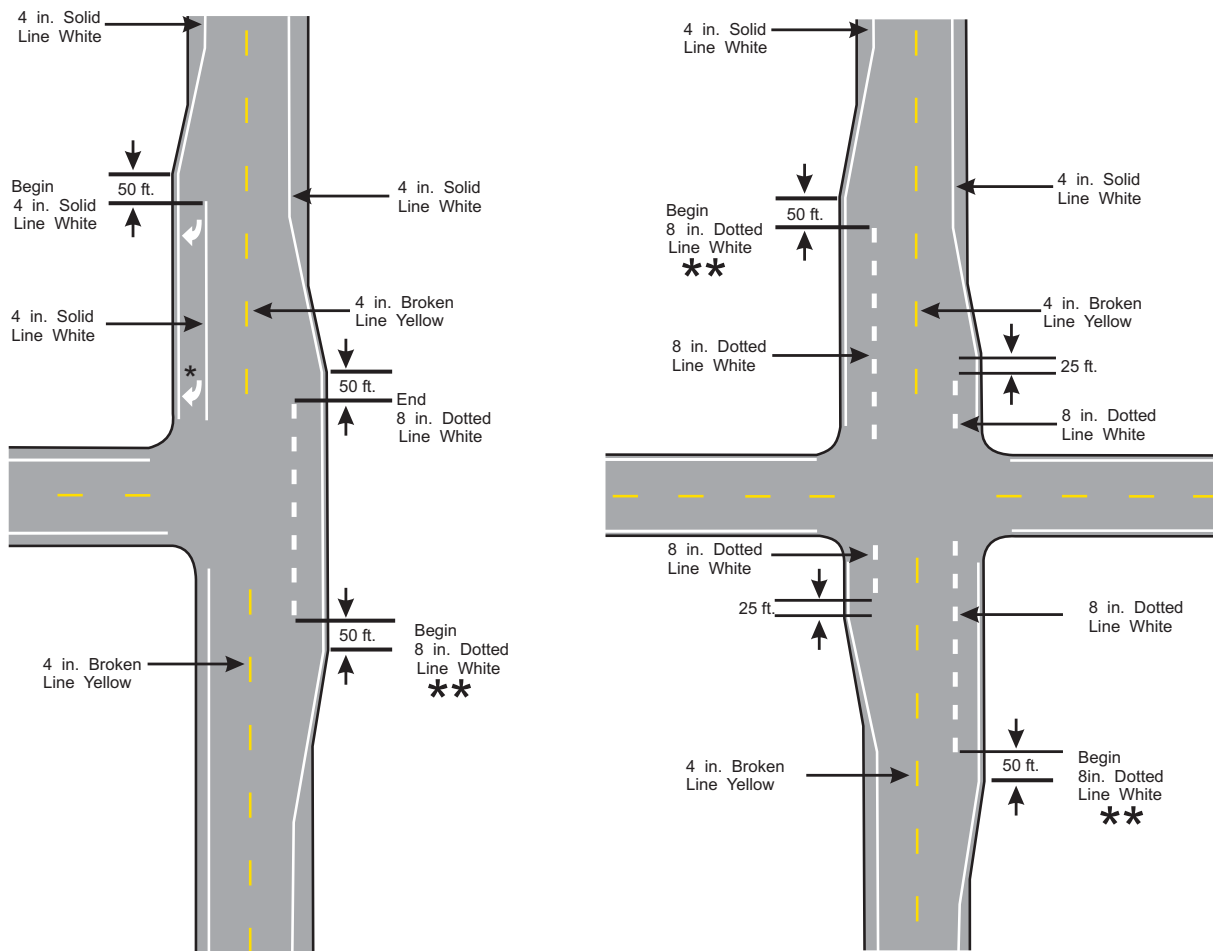
* See Chart 7-4.

Text Ref.: 7-4.03.12

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**UNDIVIDED ROADWAY TRANSITION
PAVEMENT MARKINGS**

**FIGURE
7.12**



Note:
 No Passing Zones at intersections shall be striped for 500 feet on both sides of the intersection if it is located within the city limits. No Passing Zones at intersections shall be striped if located within any established No Passing Zone. No Passing Zone striping is optional at the discretion of the district traffic engineer for rural intersections. See Chart 7-4.

* See Figure 7.9 for the typical message placement of turn arrows.

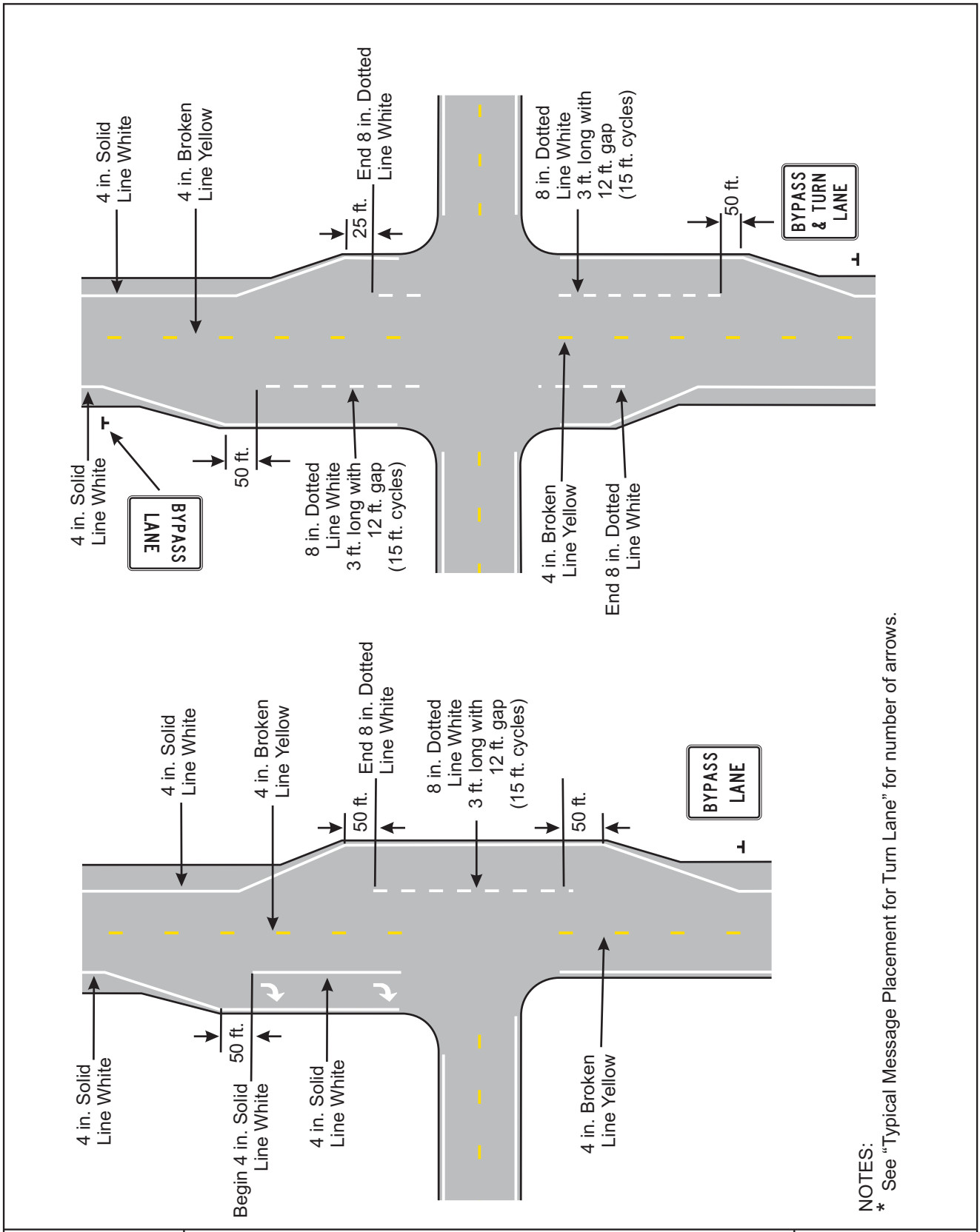
** 3 foot long line with a 12 foot gap.

Text Ref.: 7-4.03.10

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**BYPASS LANE
 PAVEMENT MARKINGS**

**FIGURE
 7.10**

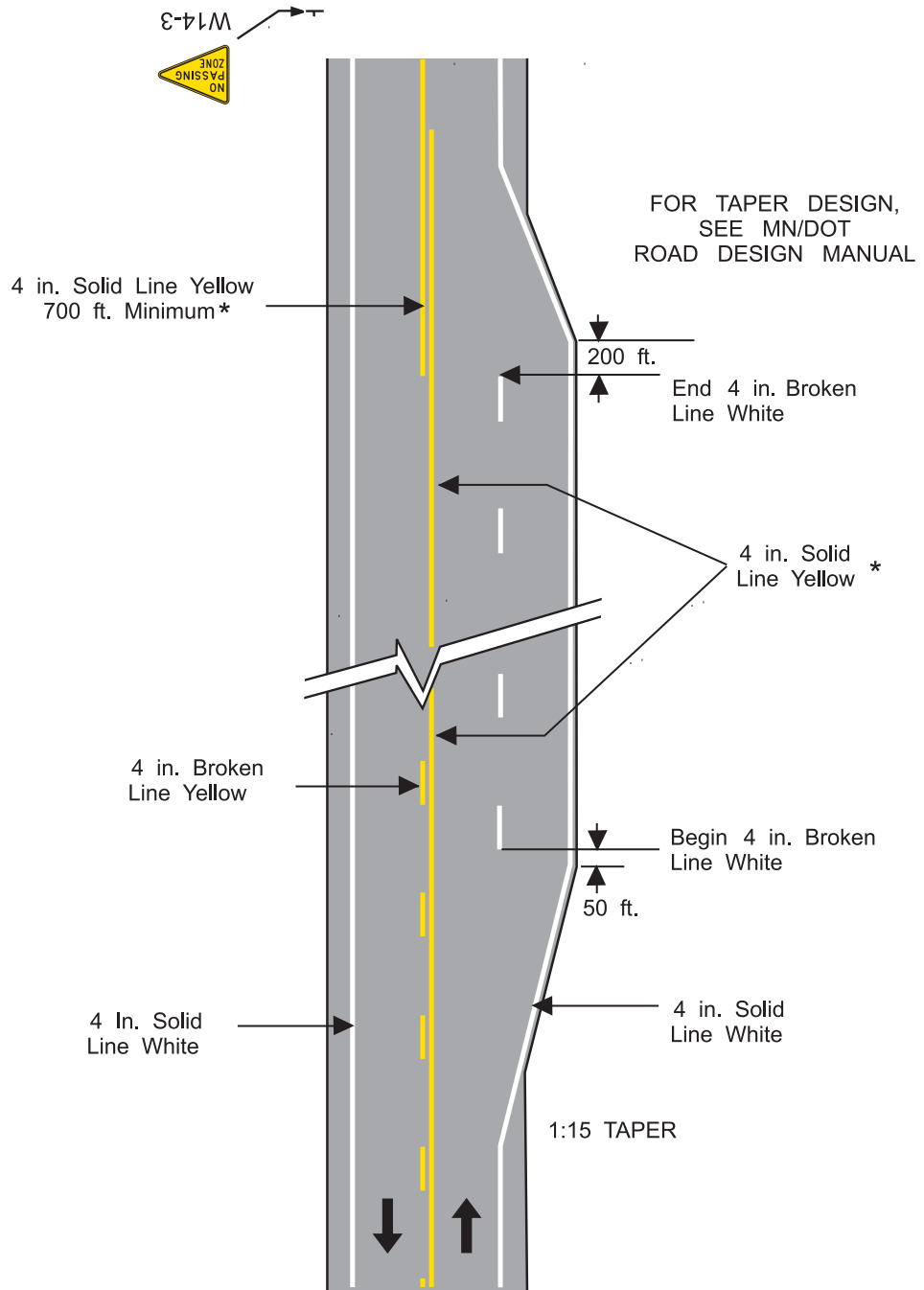


NOTES:
 * See "Typical Message Placement for Turn Lane" for number of arrows.

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BYPASS LANES

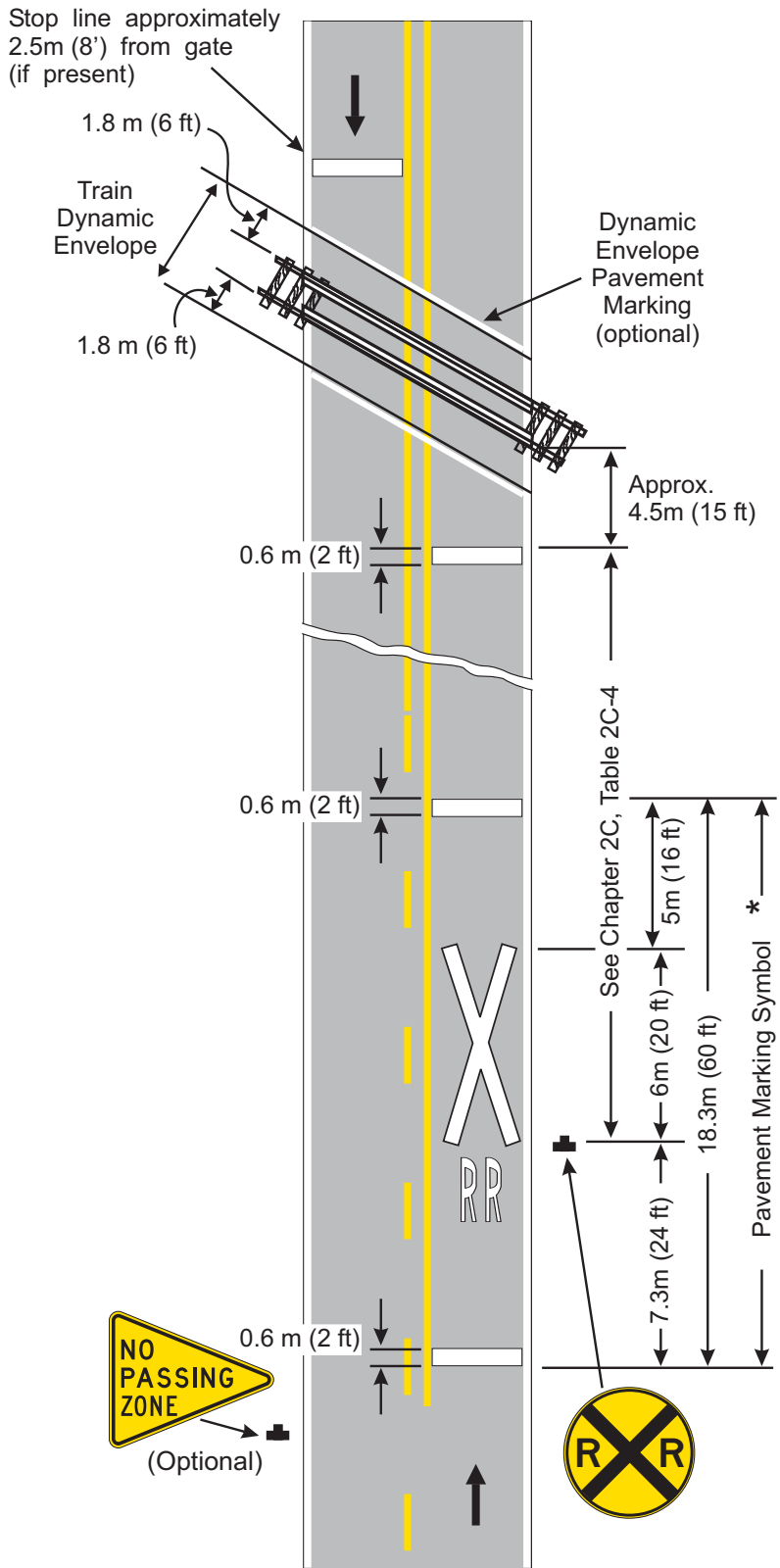
FIGURE 6.17



* See Chart 7-4.

Text Ref.: 7-4.03.13

<p>May 15, 2008</p>	<p>TRUCK CLIMBING LANE PAVEMENT MARKINGS</p>	<p>FIGURE 7.13</p>
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A three lane roadway should be marked with a centerline for two-lane approach operation on the approach to a crossing.

On multi-lane roads the transverse bands should extend across all approach lanes, and individual RXR symbols should be used in each approach lane.

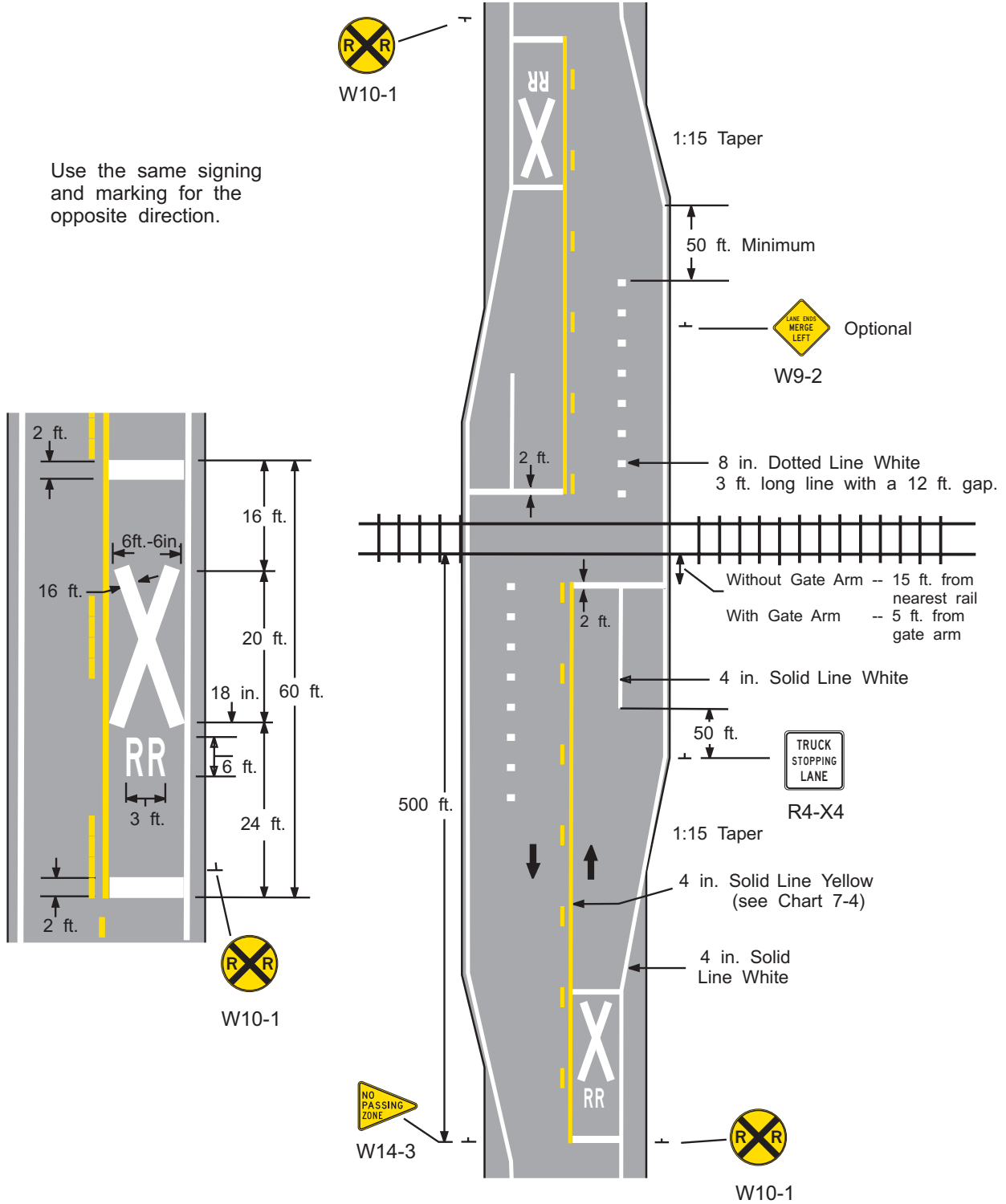
Refer to the FHWA Standard Alphabet for Highway Signs and Markings for RXR symbol details.

* When used, a portion of the pavement marking symbol should be directly opposite the Advance Warning Sign (W10-1). If needed, supplemental pavement marking symbol(s) may be placed between the Advance Warning Sign and the crossing, but should be at least 15 m (50 ft.) from the Stop Line.

Note: In an effort to simplify the figure to show warning sign and pavement marking placement, not all required traffic control devices are shown.

Figure 8B-6. Example of Placement of Warning Signs and Pavement Markings at Highway-Rail Grade Crossings

Use the same signing and marking for the opposite direction.

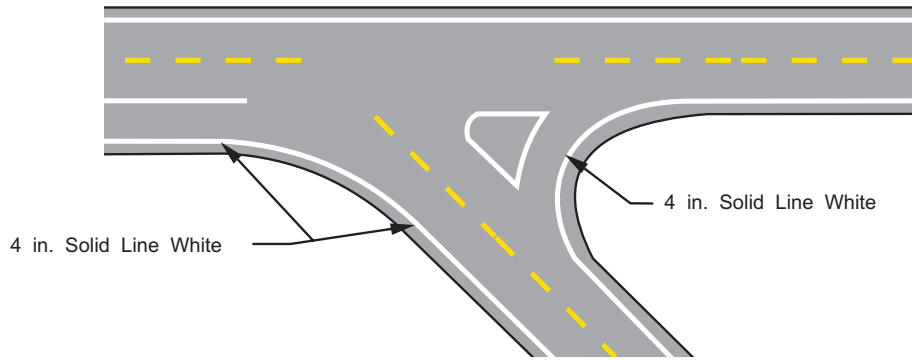


Text Ref.: 7-4.03.14 and 7-4.06.03

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**RAILROAD CROSSINGS WITH TRUCK STOPPING LANE
PAVEMENT MARKINGS**

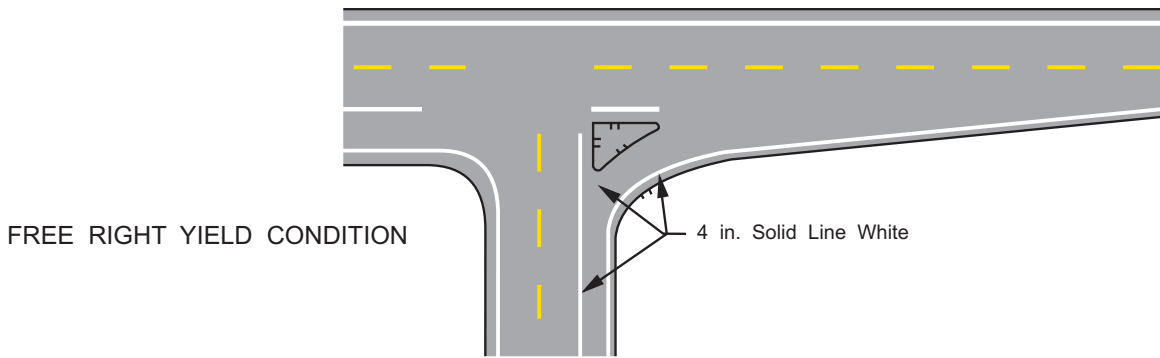
**FIGURE
7.14**



4 in. Solid Line White

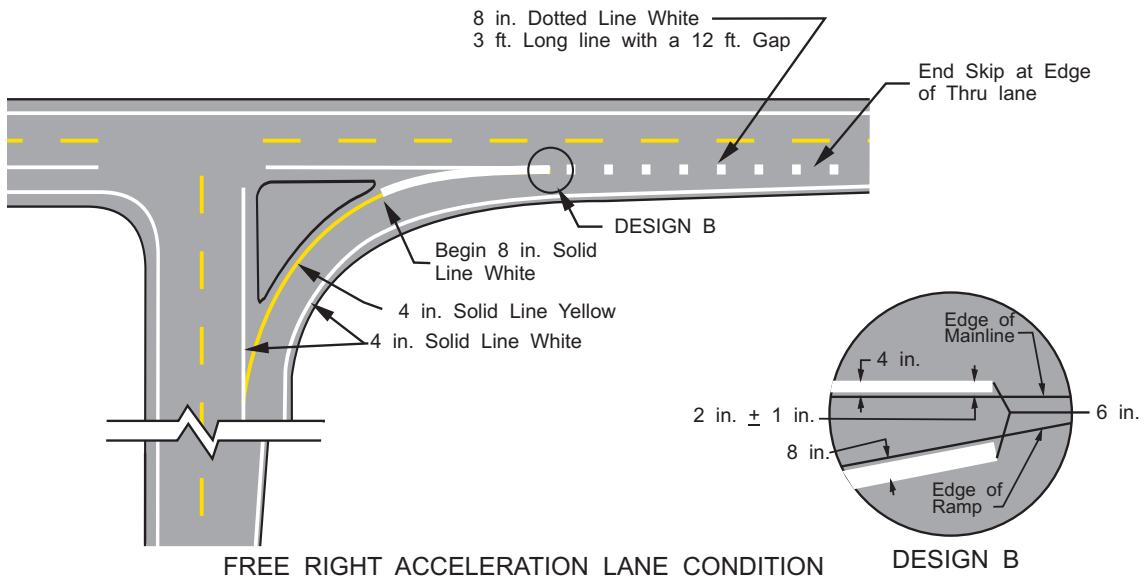
4 in. Solid Line White

FREE RIGHT STOP CONDITION



FREE RIGHT YIELD CONDITION

4 in. Solid Line White



8 in. Dotted Line White
3 ft. Long line with a 12 ft. Gap

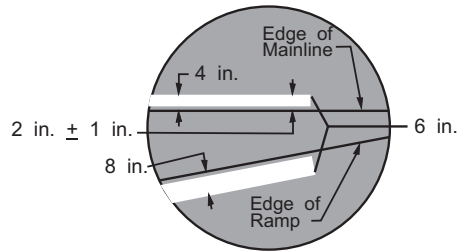
End Skip at Edge of Thru lane

DESIGN B

Begin 8 in. Solid Line White

4 in. Solid Line Yellow

4 in. Solid Line White



FREE RIGHT ACCELERATION LANE CONDITION

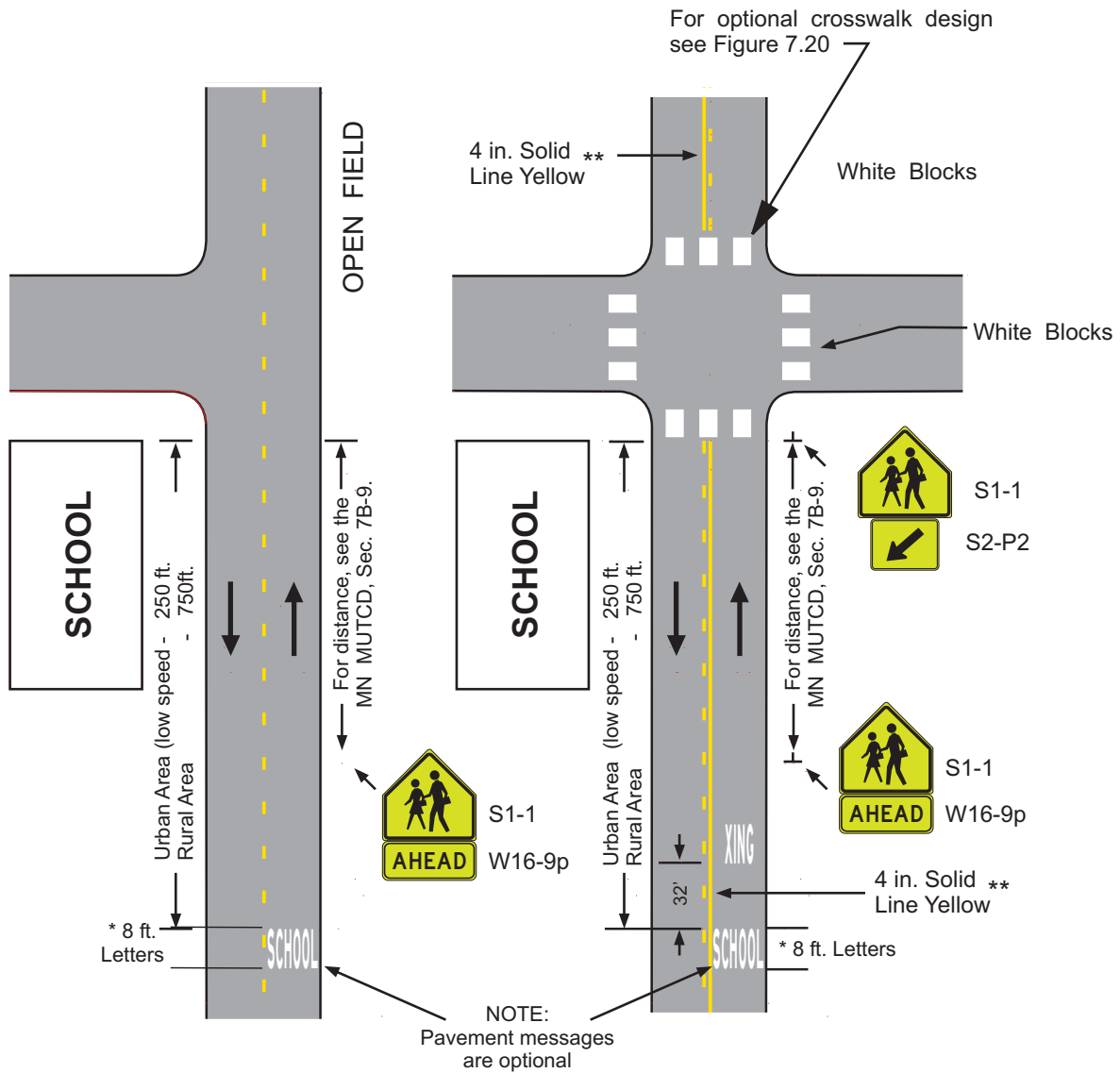
DESIGN B

Text Ref.: 7-4.03.15

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**FREE RIGHT TURN LANE
PAVEMENT MARKINGS**

**FIGURE
7.15**



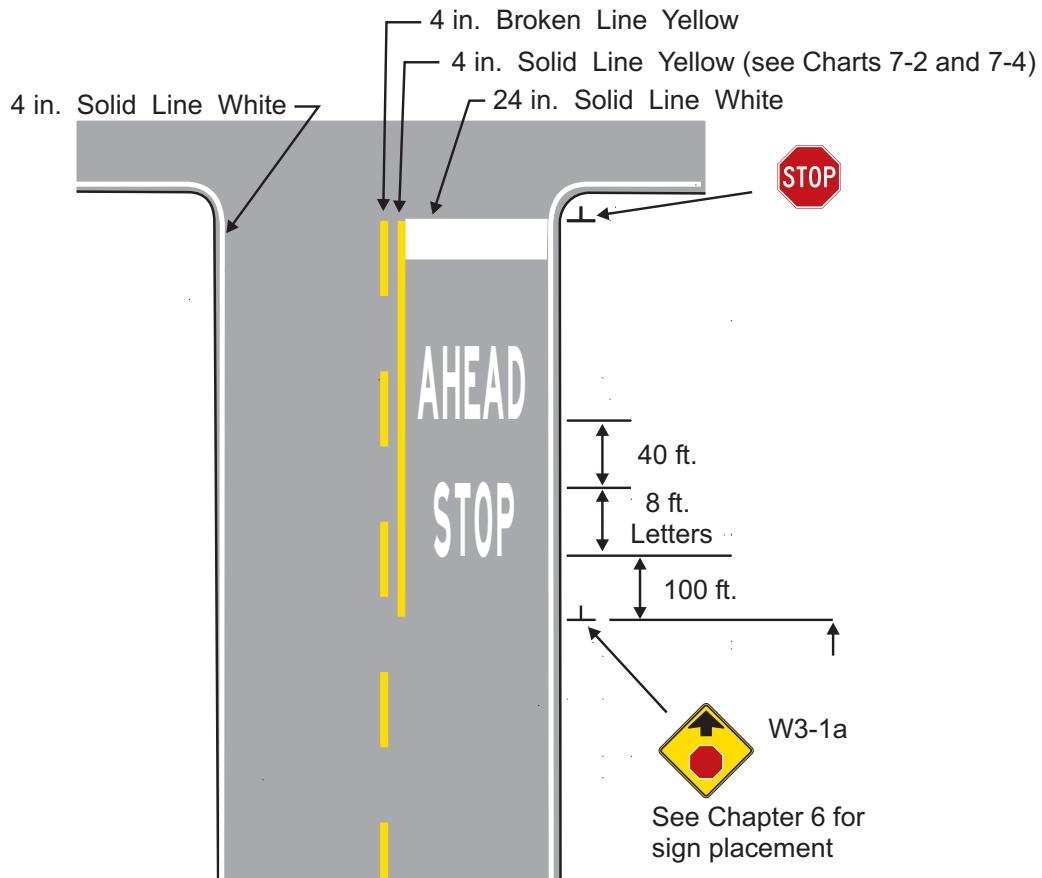
- * 6 ft. Letters may be used if the approach speeds are low.
- ** See Charts 7-2 and 7-4 for length of No Passing Zone line

Text Ref.: 7-4.06.02

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SCHOOL ZONE MARKINGS - UNSIGNALIZED INTERSECTIONS

FIGURE 7.21



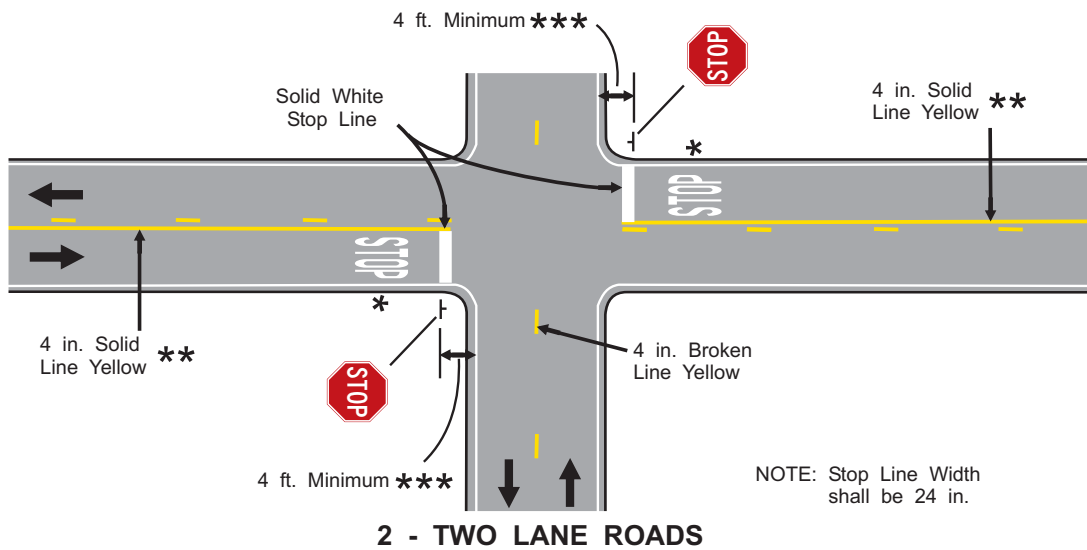
NOTES:

1. Do not install a STOP AHEAD pavement message if the intersection has adequate lighting.
2. Install only one set of STOP AHEAD pavement messages. If a Stop Ahead sign needs to be installed more than 1000 feet from the STOP sign, contact the district traffic engineer to determine if, and where, a second set of STOP AHEAD pavement messages should be installed.
3. The stop line should ordinarily be placed 4 feet in advance of and parallel to the nearest crosswalk line. In the absence of a marked crosswalk, the stop line should be placed at the desired stopping point, and in no case no more than 30 feet or less than four feet from the nearest edge of the intersecting curb line or the near edge of the thru lane.

If a stop line is used in conjunction with a stop sign, it should ordinarily be placed in line with the stop sign. However, if the sign cannot be located exactly where vehicles are expected to stop, the stop line should be placed at the stopping point.

Text Ref.: 7-4.06.04

May 15, 2008	STOP AHEAD & STOP LINE PAVEMENT MARKINGS	FIGURE 7.22
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* Optional

** see Charts 7-2 and 7-4

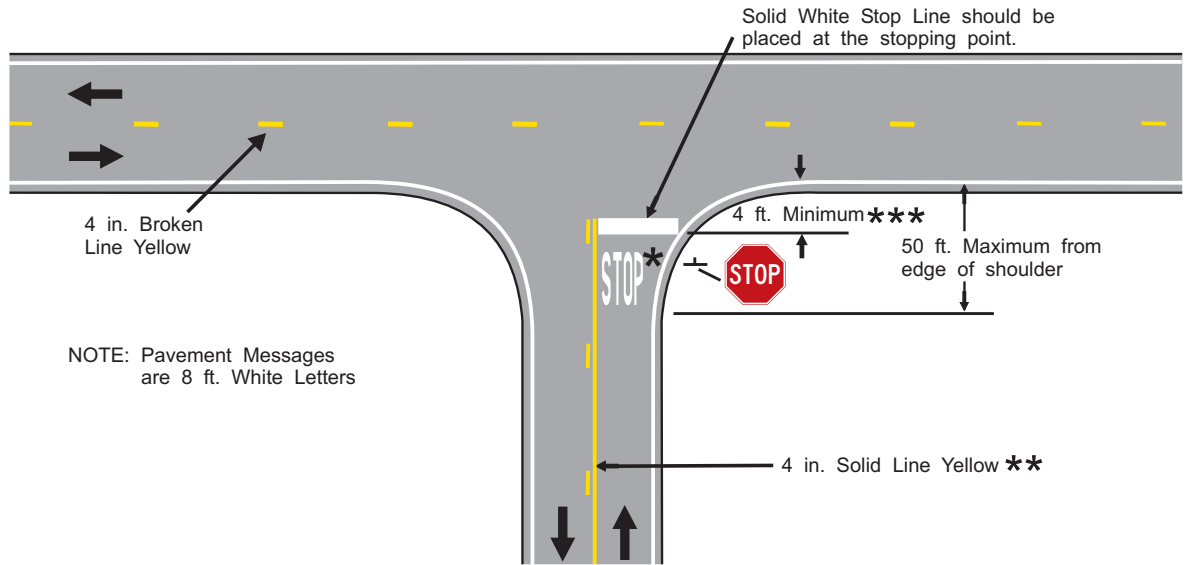
*** from Curb Line or near edge of the thru traveled lane.

Text Ref.: 7-4.03.06

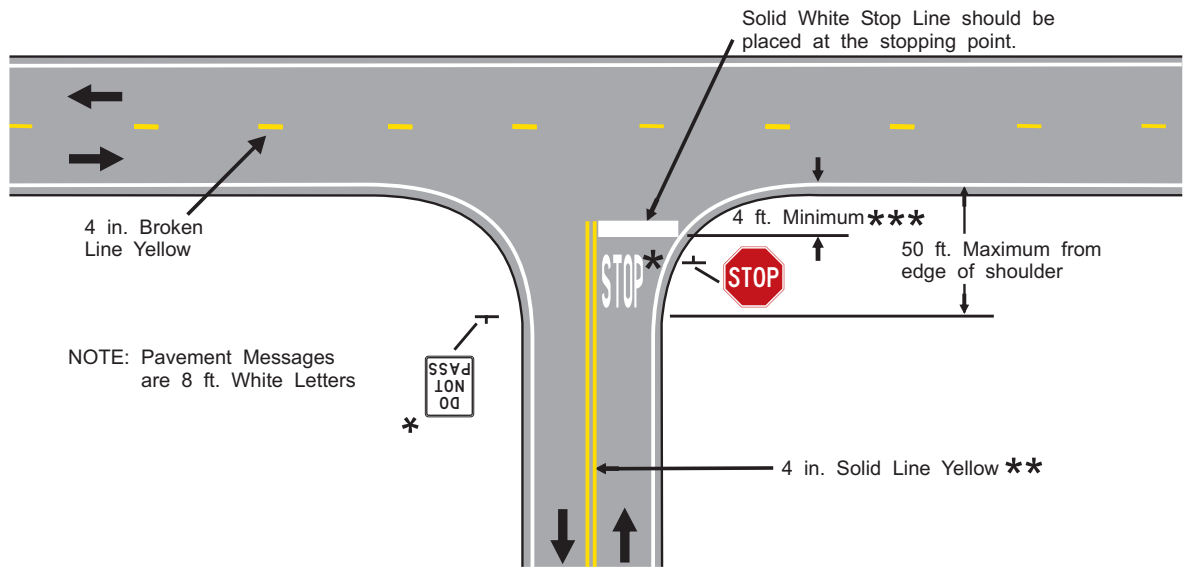
May 15, 2008

MAJOR INTERSECTION PAVEMENT MARKINGS

**FIGURE
7.5A**



LARGE RADIUS INTERSECTION



LARGE RADIUS INTERSECTION

* Optional

** see Charts 7-2 and 7-4

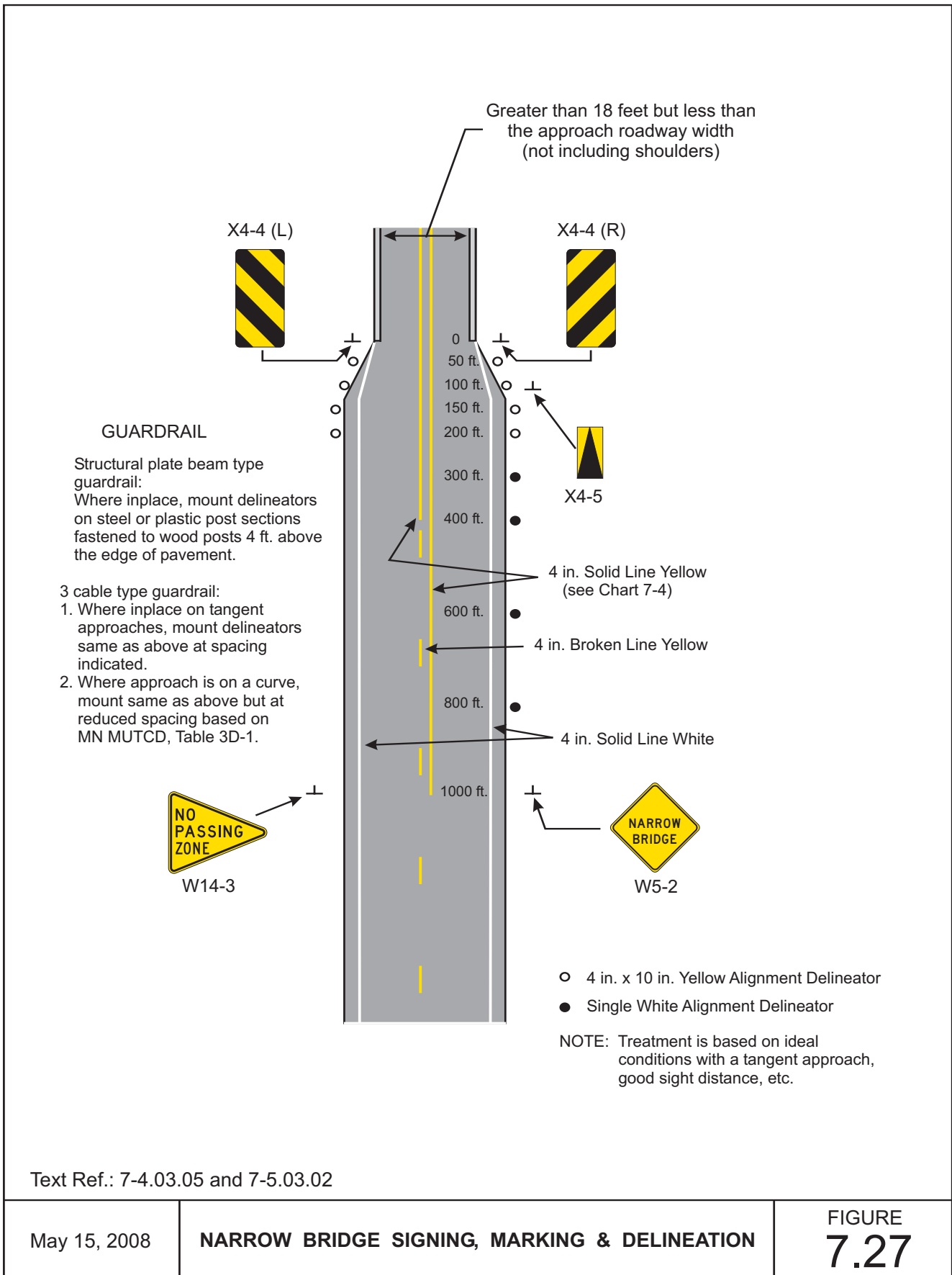
*** from Curb Line or near edge of the thru traveled lane.

Text Ref.: 7-4.03.06

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MAJOR INTERSECTION PAVEMENT MARKINGS

**FIGURE
7.5B**

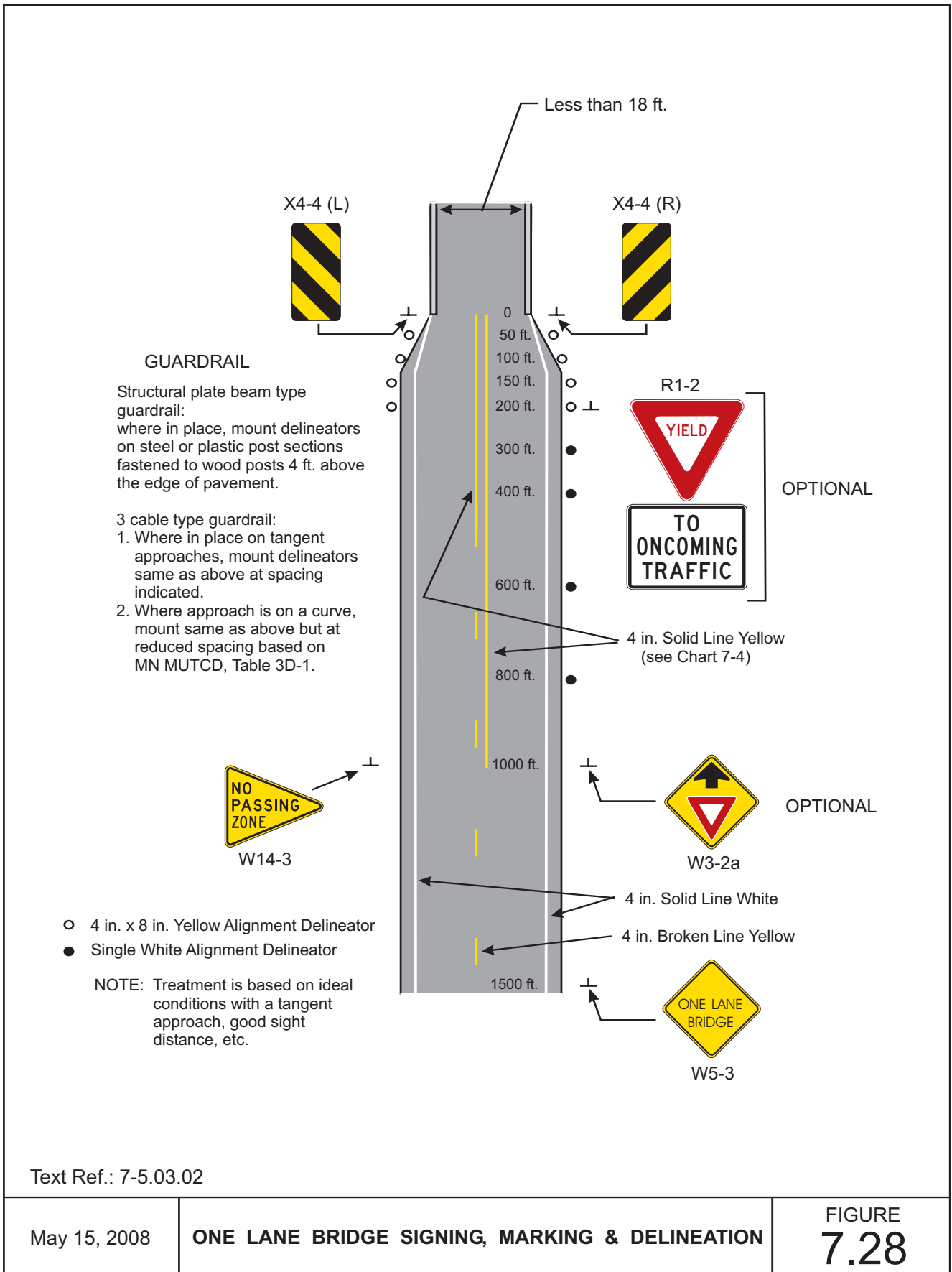


Text Ref.: 7-4.03.05 and 7-5.03.02

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NARROW BRIDGE SIGNING, MARKING & DELINEATION

**FIGURE
7.27**

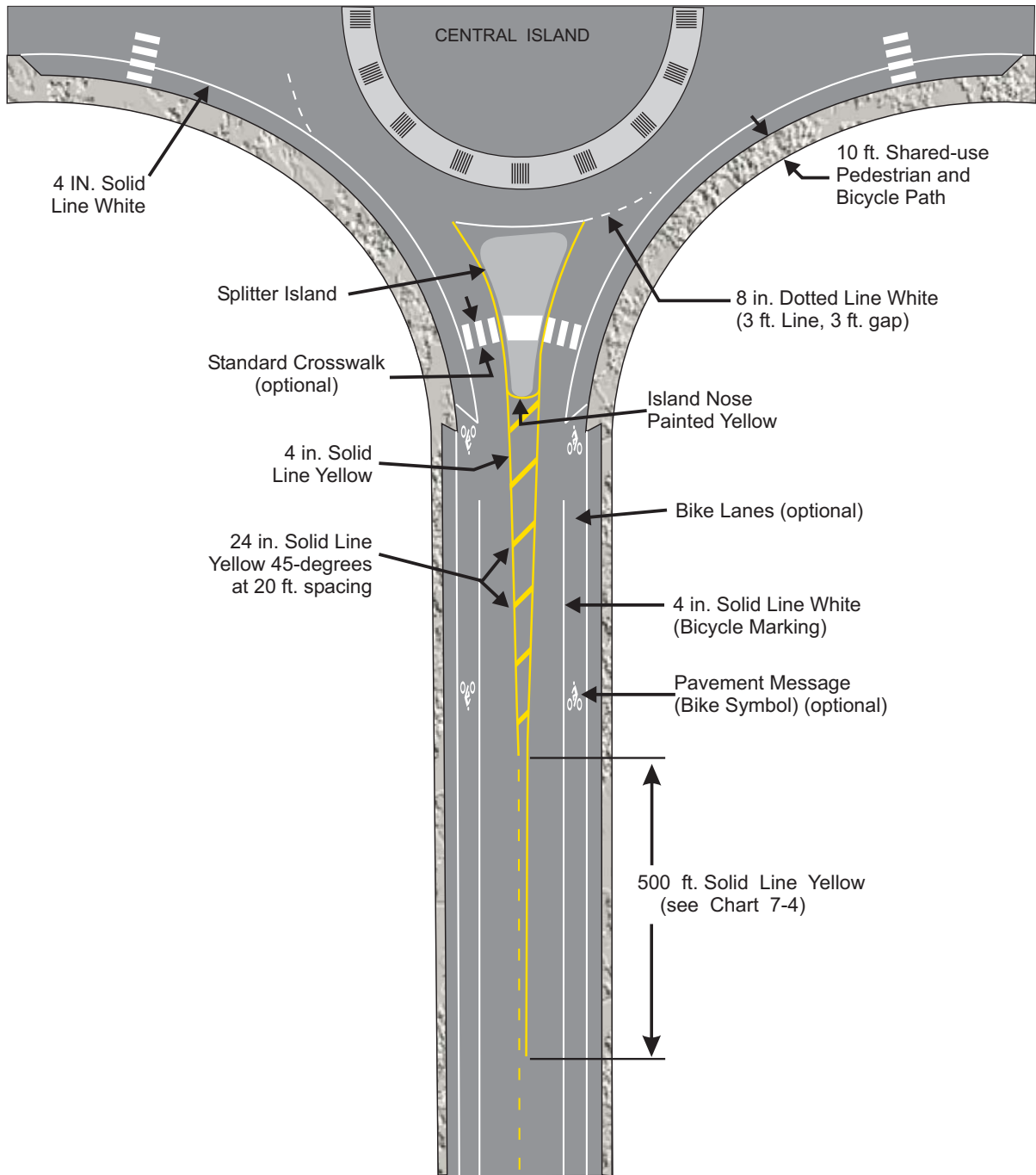


Text Ref.: 7-5.03.02

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ONE LANE BRIDGE SIGNING, MARKING & DELINEATION

FIGURE
7.28

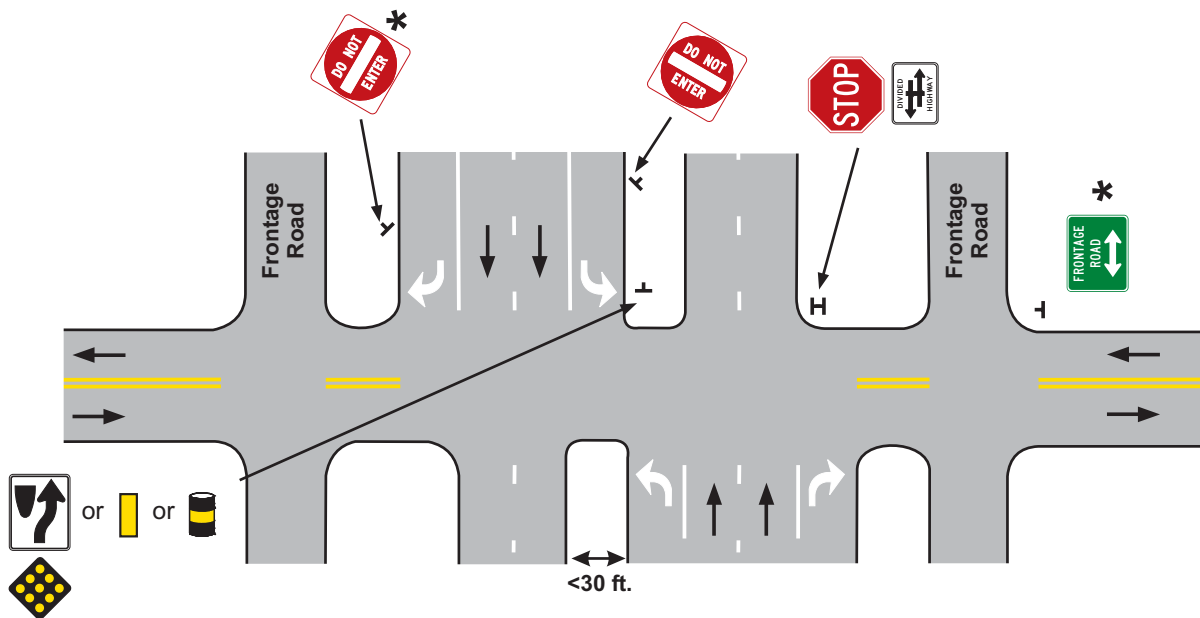


Text Ref.: 7-4.06.10

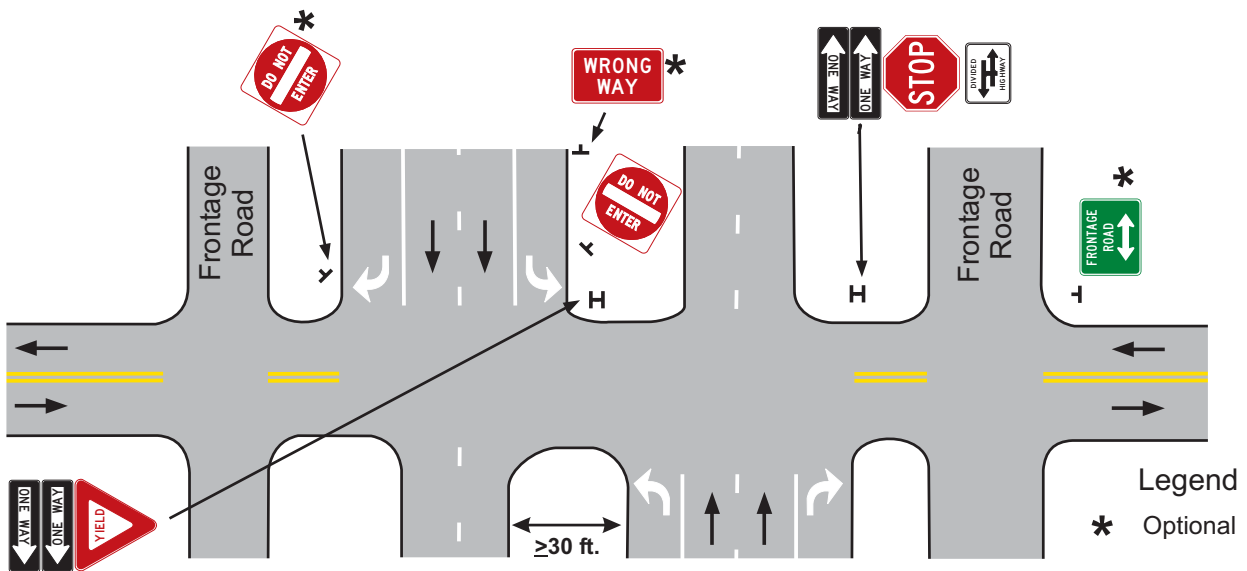
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**ROUNDBOUT INTERSECTION
PAVEMENT MARKINGS**

**FIGURE
7.36**



Median Less Than 30 ft.



Median 30 ft. or Greater

Legend

- Type 2 Object Marker
- Cylinder Style Delineator
- * Optional

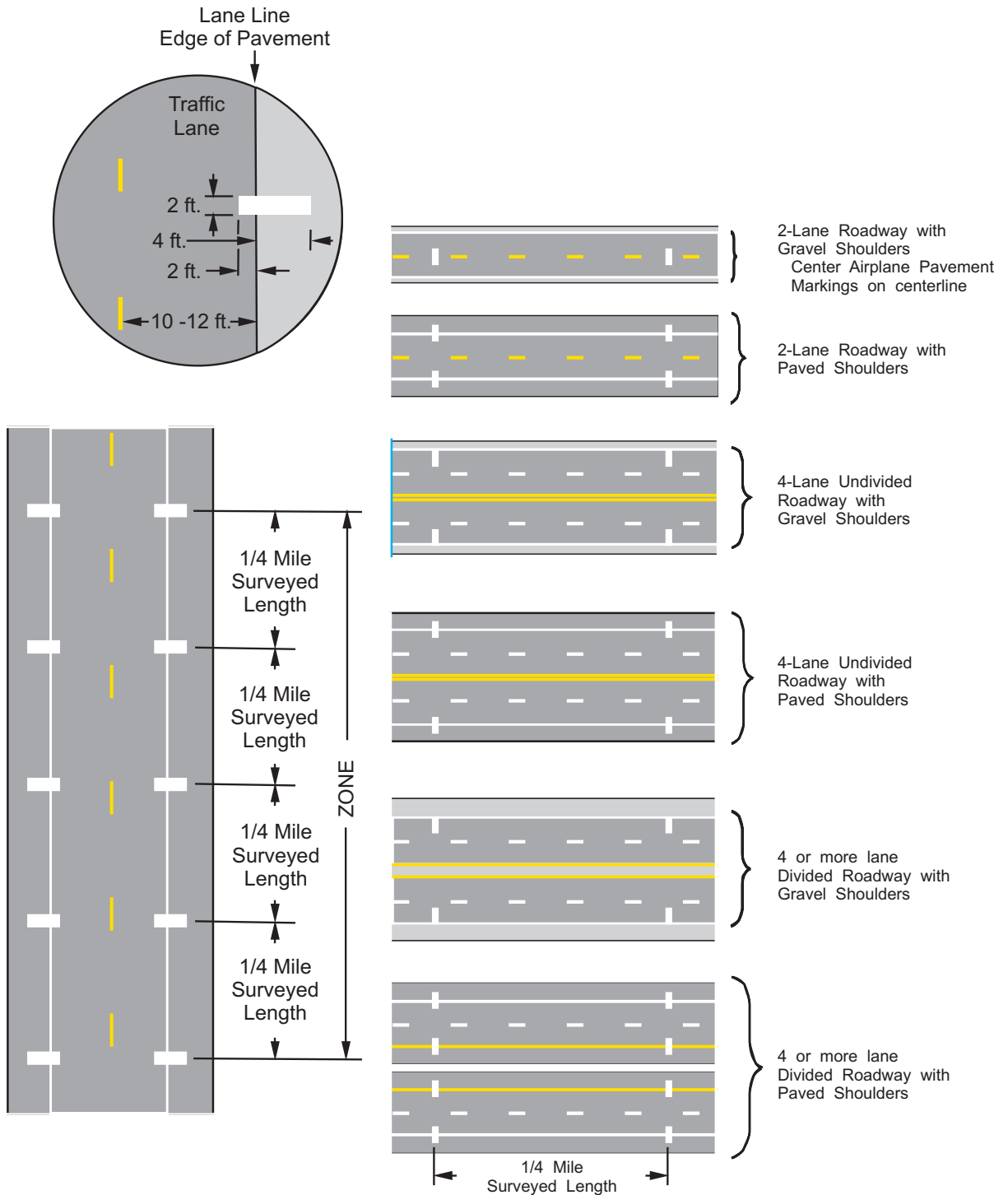
NOTES:

1. Signing is identical on both sides of the intersection.
2. See Chapter 7 for application of markings.

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**REGULATORY SIGNS FOR DIVIDED
HIGHWAY INTERSECTIONS WITH FRONTAGE ROADS**

**FIGURE
6.8**

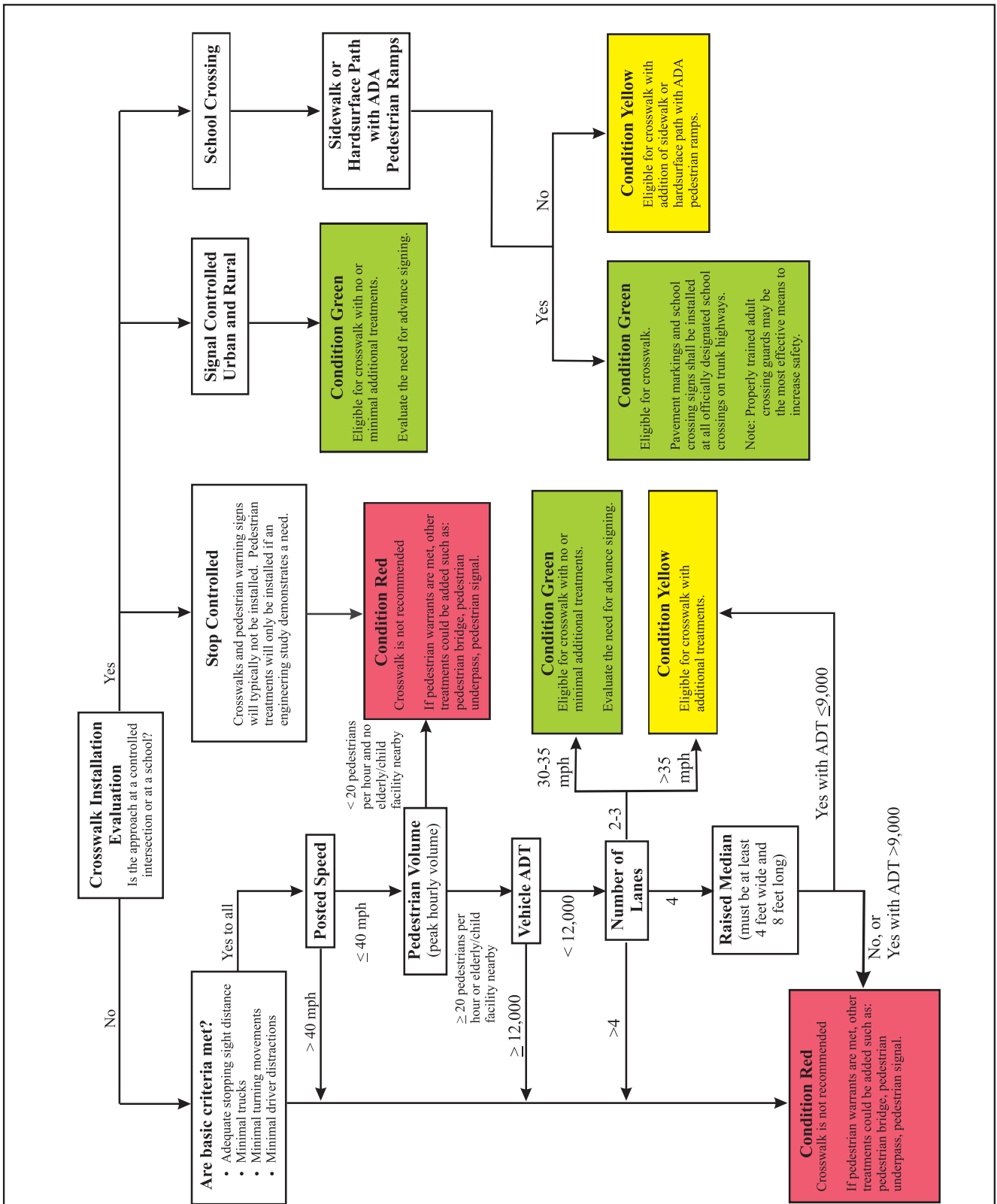


Text Ref.: 7-4.06.08

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AIRPLANE PAVEMENT MARKINGS

**FIGURE
7.24**



Text Ref.: 7-6.02.02

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CROSSWALK WARRANTS

**CHART
7-8**