410 NO-PASSING ZONES (NPZ)

410.1 LEGAL AUTHORITY

No-Passing Zone (NPZ) pavement markings are defined as a double yellow centerline consisting of two solid yellow lines, which prohibit passing in both directions, or a double line consisting of a broken and a solid yellow line, which prohibits passing in the direction adjacent to the solid yellow line. NPZ markings are installed along two-lane or three-lane roadways where an engineering survey indicates that passing maneuvers must be prohibited due to limited vertical or horizontal sight distance or other special conditions. These special conditions include but are not limited to junctions, driveways, overpass structures, etc.

Authority for establishing NPZs is covered in Arizona Revised Statutes §28-727. The Regional Traffic Engineer (RTE), or designee, will review and approve the newly established or recommended NPZ changes. Limitations on overtaking on the left are covered in Arizona Revised Statutes §28-725 and limitations on driving to the left of the roadway center are covered in Arizona Revised Statutes §28-726.

The purpose of the No-Passing Zone Program is to routinely field check the existing NPZs along all two and three-lane undivided highways in the State Highway System and develop recommendations for appropriate striping changes based on operational need. NPZs can also be evaluated and established for new roadways under this Program.

The Traffic Maintenance Signing & Striping group is responsible for:

- Reviewing the existing NPZ striping to verify that it matches the most recent NPZ survey, identifying any discrepancies between the striping and the survey, and confirming there are no new sight visibility issues found in the field.

The Regional Traffic Engineering office is responsible for:

- Evaluating potential changes to the NPZ survey, making recommendations based on an engineering review, and issuing work orders for any recommended changes in the NPZ Survey.

Changes in No-Passing Zones must be approved by the Regional Traffic Engineer or their designee before such zones are marked. Requests for sight obstruction removals must be approved by the Regional Traffic Engineer, or their designee, and implemented by the Engineering District Roadway Maintenance Superintendent.

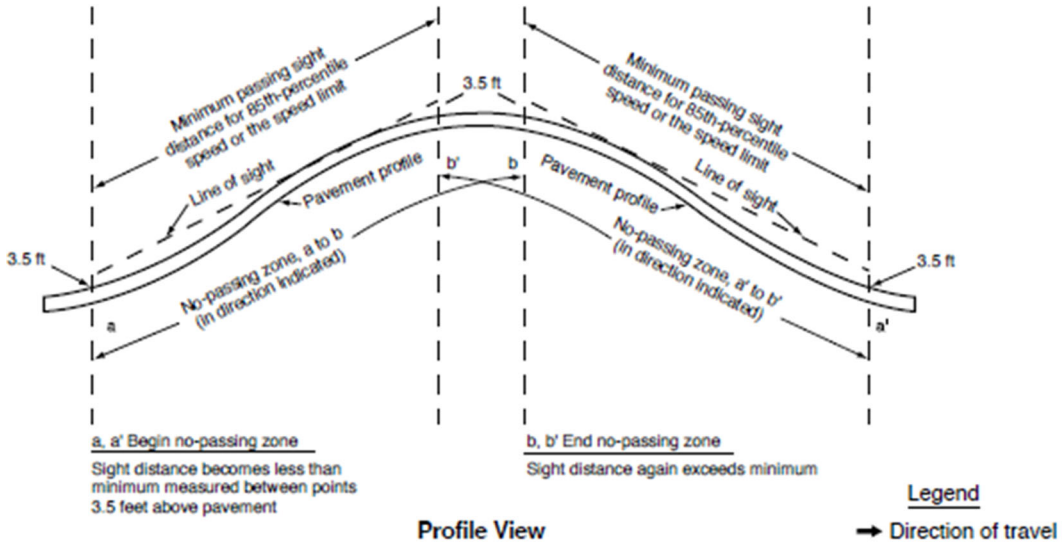
410.2 WARRANTS

Passing sight distance on a vertical curve is determined by the distance at which an object 3.5 feet above the pavement surface can be seen from a point 3.5 feet above the pavement as shown in the Pavement Markings Chapter 3 of the MUTCD (see Figure 410-A).

Similarly, passing sight distance on a horizontal curve is the distance measured along the centerline between two points 3.5 feet above the pavement on a line tangent to the embankment or other obstruction that impairs the view on the inside of the curve (see Figure 410-B).

Method of Locating and Determining the Limits of No-Passing Zones at Curves

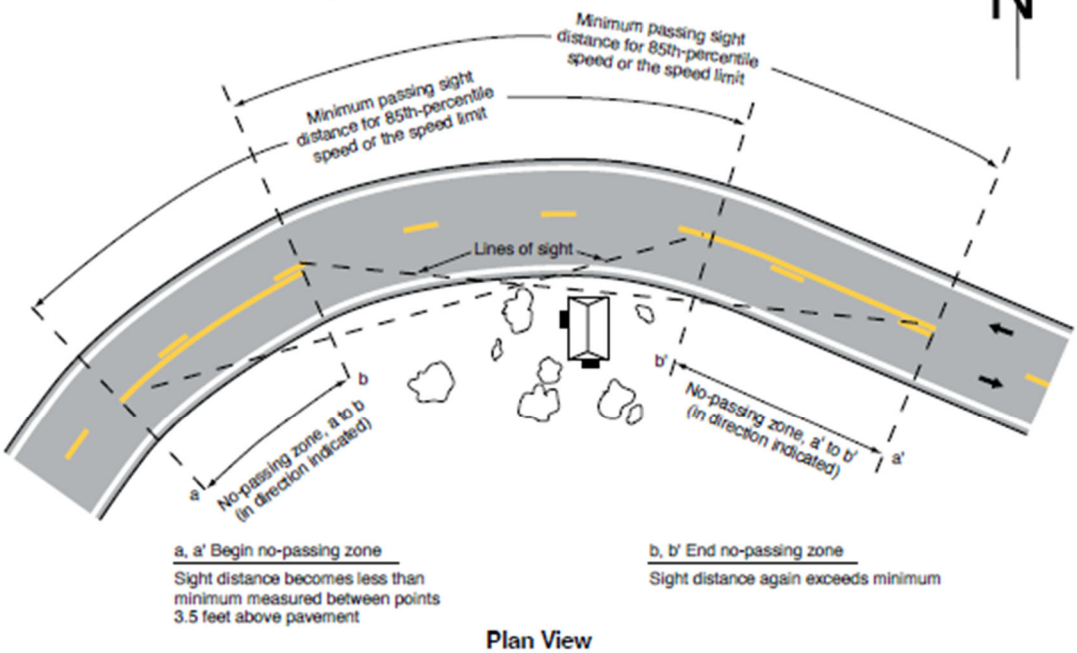
Figure 410 - A - No Passing Zone at a Vertical Curve



Profile View

Note: No-passing zones in opposite directions might or might not overlap, depending on alignment

Figure 410- B - No Passing Zone at a Horizontal Curve



Plan View

Note: No-passing zones in opposite directions might or might not overlap, depending on alignment

A NPZ at a horizontal or vertical curve is warranted where the passing sight distance, as defined below in Table 410-1, is less than the minimum necessary for safe passing at the posted speed. The recommended minimum length for a passing zone can be found in Table 410-2.

Table 410-1. No-Passing Zone Criteria

Posted Speed or 85th Percentile (mph)	Minimum Passing Sight Distance Required (feet)
25	450
30	500
35	550
40	600
45	700
50	800
55	900
60	1000
65	1100
70	1200

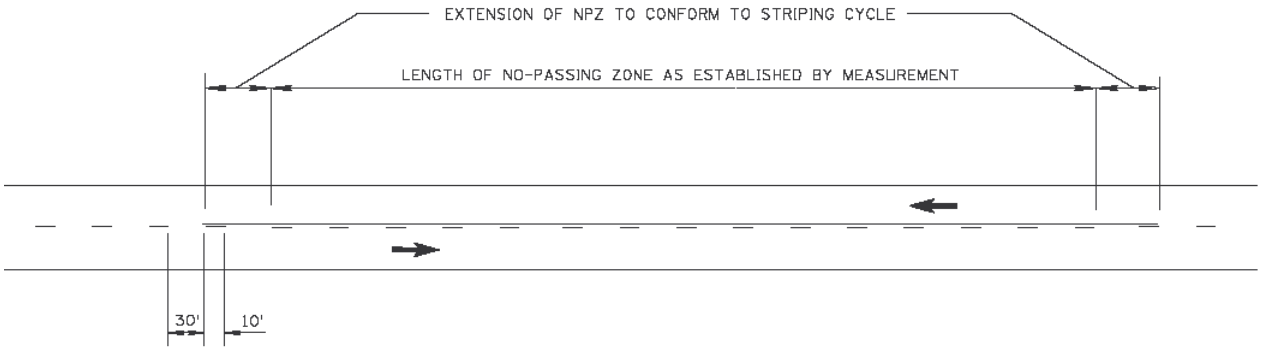
Source: MUTCD 11th Ed. Table 3B-1

Allowable Tolerances for Adjustments

The beginning of an NPZ is the point at which the passing sight distance first becomes less than that specified in Table 410-1. The end of the zone is the point at which the passing sight distance again becomes greater than or equal to the minimum specified. No field adjustments shall be made to the end of a zone to alter its location from the point established by a proper survey, with the exception that the end may be extended to coincide with the end of the nearest centerline stripe (see Figure 410-C).

Where a NPZ pennant sign (W14-3) exists at the beginning of a NPZ, a NPZ re-survey shall show a change of at least 120 feet (or more than 0.023 miles) before requiring that the sign be relocated.

Figure 410-C.
Extension of No-Passing Zone Striping to Coincide With The Centerline Striping Cycle



Minimum Distance Between No-Passing Zones

The minimum distance between NPZs is 400 feet, as per the MUTCD Section 3B. This is a numerical guide and is subject to engineering judgment. Any time the gap between the NPZs falls below these minimums, the NPZs should be joined together.

Table 410-2. Recommended Minimum Passing Zone Lengths

85th percentile speed or posted or statutory speed limit (mph)	Minimum passing zone length (ft)
20	400
30	550
35	650
40	750
45	800
50	800
55	800
60	800
65	800
70	800

NCHRP 605 - On Min. Passing Zone Length

Sight Restriction Evaluation

Before NPZs 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 should be made, checking to see if the target vehicle is completely out of sight for approximately 150 feet. If the target vehicle does not go completely out of sight, the NPZ may be disregarded. Sound judgment should be exercised by the NPZ field technician, taking into consideration distance traveled and time elapsed during the sight restriction and weighing these factors against the time which both drivers must observe each other prior to reaching the sight obstruction. Whenever doubt exists, the NPZ shall be lengthened to a minimum length of 500 feet with **coordination with the RTE.**

Removal of Sight Obstructions

When minor maintenance activity can be performed to remove sight obstructions, a "Request for Sight Obstruction Removal" Memo should be prepared by the **Regional Traffic Engineer, Traffic Maintenance Group, or their designee**, and sent to the appropriate Traffic Engineering Region and District Maintenance Superintendent for action. Requests for removal(s) of sight obstructions are normally limited to work needed to avoid extending an NPZ, i.e. brush removal, sign relocation, etc.

Uphill Passing Lanes

For uphill passing lanes, the centerline for downhill traffic shall be solid from 500 feet in advance of the initial taper to 200 feet past the end of the terminal taper.

On three-lane roadways where the direction of travel in the center-lane transitions from one direction to the other, a NPZ shall be provided in the center lane as shown in Section 3B.02 of the MUTCD. A lane reduction transition shall be provided at each end of the buffer zone.

The buffer zone shall be a flush median island formed by two sets of double yellow centerline markings that are at least 50 feet in length.

The minimum lane transition taper length should be 100 feet in urban areas and 200 feet in rural areas.

Grade Crossings
An NPZ is required when approaching within 100 feet of a railroad grade crossing according to Arizona Revised Statute §28-726.

Bridge, Viaduct or Tunnel
An NPZ is required when the view is obstructed approaching within 100 feet of any bridge, viaduct or tunnel according to Arizona Revised Statutes §28-726.

New Construction/Reconstruction/Permit Projects
For any striping installations on Construction, Reconstruction, or Permit projects on two-lane and three-lane roadways, District or Project personnel shall notify the Regional Signing and Striping Traffic Maintenance Superintendent to schedule an NPZ Survey at least two weeks prior to the application of the final surface course.

Crossover Structures (Bridges, Overpasses, and Underpasses)
Due to the permanence of the immediate environment, existing structures need to be reviewed, typically once every five years. New structures shall be reviewed as they are completed. Subsequently, they should be included in each five-year overall review. Surveys should only be completed for changing conditions.

Sight restrictions at these locations shall be marked to the extent that the existing pavement allows. Total NPZ lengths shall be recorded, even if unpaved roadways prevent marking. Recorded distances should be referenced from the right-of-way line (0.00), increasing in normal milepost direction (eastbound or northbound).

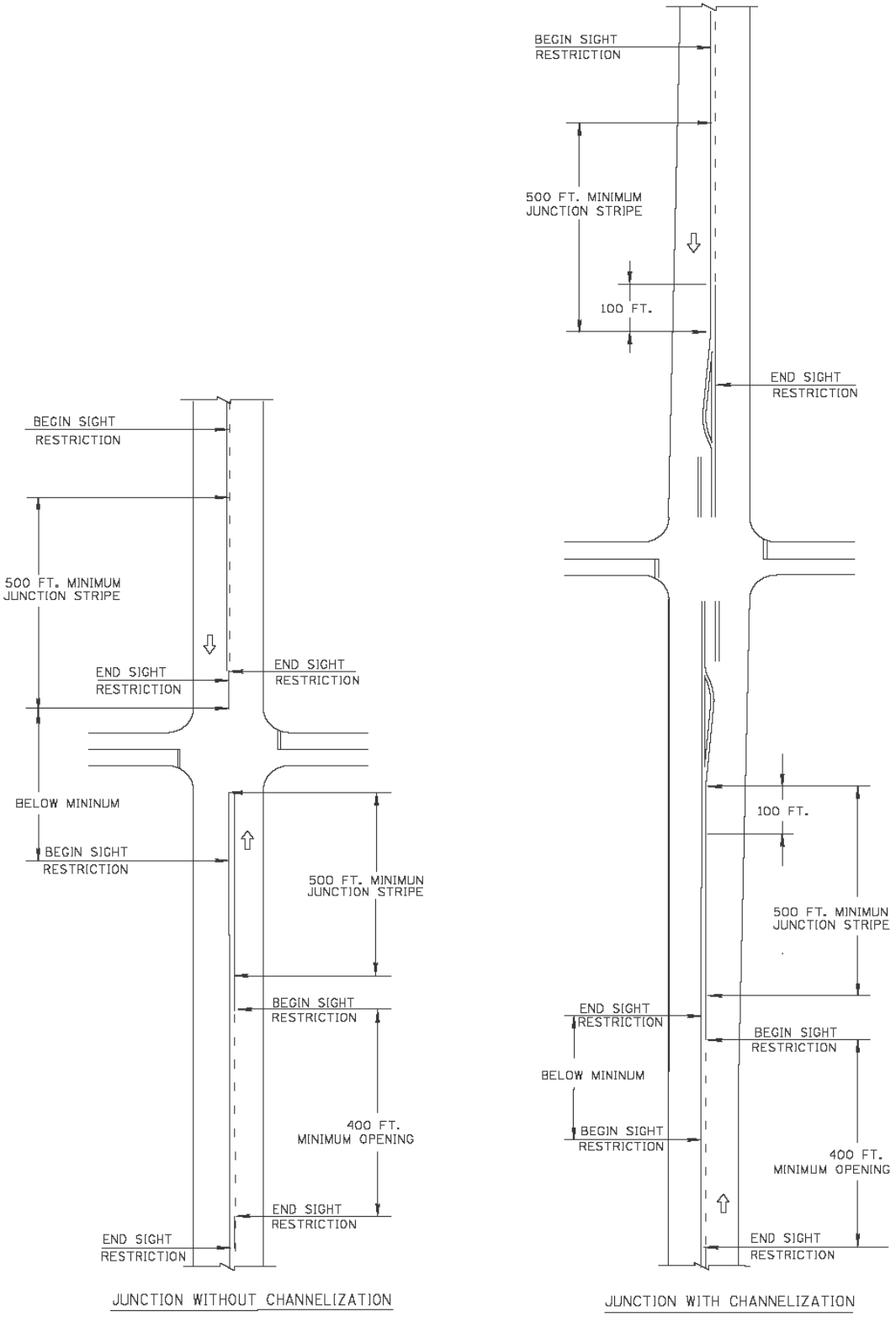
Intersection or Junction
Barrier Striping is defined as a NPZ pavement marking that identifies the presence and limits of an NPZ that is established for reasons other than sight restrictions, such as a highway intersection, or a railroad crossing. A NPZ is required when approaching within 100 feet of any intersection or junction according to Arizona Revised Statute §28-726.

A special striping configuration may be installed at a junction where a certain combination of junction striping and sight restrictions indicate it is proper to do so (see Figure 410-D). Where the extension of NPZ striping is required to satisfy a requirement for junction striping, it may become necessary to join two NPZs in the same direction, to avoid a short stripe for the opposite direction.

A new NPZ at a junction/intersection or driveway/turnout may be considered for implementation if any of the following criteria are met:

- The minimum average daily traffic volume on the intersecting roadway or driveway/turnout is 50-100 vehicles per day.
- The minimum crash experience is 2 or more recorded crashes related to passing within a 3-year period.
- The Left Turn Lane warrant is met at the junction/intersection per TGP 245.

Figure 410-D. Junctions Requiring NPZ Striping Located Within A Sight Restriction



410.3 RECORDING

All Barrier Striping which prohibits passing shall be recorded. At a minimum, the following items shall be noted on the NPZ log sheets:

1. Location - Route, Milepost, and Direction
2. Date
3. Sight restrictions
4. Junction locations (see below)
5. Railroad crossing locations (see below)
6. Beginnings and ends of sections of three or more lanes or divided highways
7. Uphill passing section limits
8. Posted speed limit
9. Milepost equations - short and long miles
10. Beginnings and ends of urban boundaries not reviewed

The abbreviations shown below are used to denote the reason for the beginning of an NPZ, also shown in Figure 410-E:

V = Vertical Sight Restriction
LH = Left Horizontal Sight Restriction
RH = Right Horizontal Sight Restriction
JCT = Junction
R/R = Railroad Crossing
UPS = Uphill Passing Section
DH = Divided Highway

Though many reasons for Barrier Striping may occur within one continuous stripe, only the reason for the beginning of the NPZ should normally be noted. Where a junction or railroad crossing is responsible for the ending location of barrier striping, its location should be noted.

Forms for NPZ Work

The form and memos discussed here and shown in the attachments are those used on a regular basis for performing the surveying and reporting functions:

(1) No-Passing Zone Survey Record (See Figure 410-E)
This form is used in compiling collected field data, as well as producing a permanent record of the survey.

(2) Log Sheet Transmittal Memo
When no signing and/or striping changes are required based on the NPZ survey, a copy of the permanent log sheet(s) shall be transmitted to the appropriate Regional Traffic Engineer for inclusion in the Region's NPZ files or logbook. Milepost limits shown in the REGARDING (RE:) segment of the heading should delimit the extreme boundaries for which the survey was done, even though a NPZ may not exist for the first several miles of the route segment.

(3) Request for Striping and/or Signing Changes Memo

When signing and/or striping changes are required based on the NPZ survey, a memo requesting the changes shall be sent to the appropriate Regional Traffic Engineer. A copy of the permanent log sheet(s) shall be transmitted with the memo to the appropriate Regional Traffic Engineer for inclusion in the Region's NPZ logbook or files.

To ensure that the changes are implemented as soon as possible, this memo shall be sent to the appropriate Region immediately upon return from the field. The Region shall keep copies of these memos in a file, by route, to verify that the Regions have been notified.

When the signing and/or striping changes have been completed by the Regional Traffic Maintenance unit, they shall return the memo to the Regional Traffic Engineering Office indicating who performed the work and the date the work was completed.

(4) Request for Sight Obstruction Removal Memo

When sight obstruction removals are required based on the NPZ survey, a memo requesting the removals shall be sent to the appropriate Regional Traffic Engineer and District Maintenance Unit. A copy of the permanent log sheet(s) shall be transmitted with the memo to the appropriate Regional Traffic Engineer for inclusion in the Region's NPZ file .

To ensure that sight obstructions will be removed as soon as possible, this memo shall be sent to the appropriate Region immediately upon returning from the field so that actual field conditions will accurately reflect what has been established by the survey. The NPZ Section shall keep copies of these memos in a file, by route, to verify that Regions have been notified.

When the sight obstructions have been removed, the Region shall return the memo to the NPZ Section indicating who performed the sight obstruction removals and the date the work was completed.

(5) Request for Striping and/or Signing Changes and Sight Obstruction Removal Memo

When signing and/or striping changes are required and sight obstructions should be removed, a memo requesting the changes shall be sent to the appropriate Regional Traffic Engineer. A copy of the permanent log sheet(s) shall be transmitted with the memo to the appropriate Regional Traffic Engineer for inclusion in the Region's NPZ file.

To ensure that the changes are implemented as soon as possible, this memo shall be sent to the appropriate Region immediately upon return from the field. The NPZ Section will keep copies of these memos in a file, by route, to verify that the Regions have been notified.

When the changes have been implemented, the Region will return the memo to the NPZ Section indicating who performed the changes and the date the work was completed.

Figure 410-E. No-Passing Zone Survey Record Form

NO - PASSING ZONE SURVEY RECORD

Route_____ Date_____ MP_____ To MP_____

Direction ↓		Speed Limit		Direction ↑		Refeaence
No-Passing Zone		Milepost		No-Passing Zone		
Milepost Locations	Length & Post			Milepost Locations	Length & Post	
APD BEG END	-			APD BEG END	-	
APD BEG END	-			APD BEG END	-	
APD BEG END	-			APD BEG END	-	
APD BEG END	-			APD BEG END	-	
APD BEG END	-			APD BEG END	-	
APD BEG END	-			APD BEG END	-	
APD BEG END	-			APD BEG END	-	
Left of Center Line				Right of Center Line		

A.P.D. - Available Passing Distance

Milepost locations are listed from the bottom to the top of the page. This layout represents zones as actually viewed in the field. Traveling with the milepost. The right column represents zones for you and the left column represents zones for oncoming traffic