

COCHRAN ROAD TEMPORARY SPEED HUMP LOCATIONS TECHNICAL MEMORANDUM

Prepared By: 

Prepared For: CCRPC & Town of Richmond

Date: December 22, 2023

PURPOSE OF MEMORANDUM

Make recommendations for appropriate application of temporary speed humps within the 25 mph speed zone at the western end of Cochran Rd.

SITE INFORMATION

Cochran Road is a Class 2 Town Highway classified as a Minor Collector. It runs west to east for approximately 3.7 miles connecting Richmond Village and Jonesville. The western end intersects with Bridge Street, Huntington Road and Thompson Road at a 4-way intersection. The eastern end intersects with Dugway Road, Wes White Hill Road and Duxbury Road, and then terminates at US Route 2 and Stage Road at a 4-way intersection.

The westernmost 0.4 mile section of Cochran Road, from Bridge Street to St. Mary's Cemetery, is primarily village scale residential and has a posted speed limit of 25 mph. East of there, roadside development is less frequent and the speed limit increases to 45 mph. The western end of Cochran Road has an AADT of approximately 2700. The road is paved, approximately 22 feet wide, with no shoulders.

The 4-way intersection with Bridge Street is a 2-way stop, with Huntington Road and Bridge Street acting as a through route. This allows vehicles eastbound on Huntington Road to enter Cochran Road at speed.

Each end of the Cochran Road 25 mph speed zone has a permanent radar speed feedback sign positioned beyond the location of the posted speed limit signs.

There are no formal bicycle or pedestrian accommodations along this section of Cochran Road, but the road is a highly used cycling route and intersects at least two off-road trail systems. Cyclists currently share the road with vehicular traffic.

A speed study performed in May of 2023 shows an average speed of 30 mph within the 25 mph speed zone, and an 85th percentile speed of 34 mph. Westbound traffic on the section of Cochran Road east of the 25 mph speed zone has an average speed of 48 mph and an 85th percentile speed of 53 mph.

LOCATION AND DESIGN GUIDANCE

- US DOT FHWA Traffic Calming ePrimer
- ITE Traffic Calming Measures
- VTrans Traffic Safety Toolbox - Speeding Countermeasures
- Manual on Uniform Traffic Control Devices 11th Edition, 2023

There are no hard and fast rules when it comes to locating speed humps once you've decided to use them. Guidance provides some input on what to consider when selecting locations:

- Distance from an intersection: 150' unsignalized, 250' signalized
- Horizontal curvature: minimum 300' radius
- Stopping sight distance
- Location of driveways and on-street parking
- Presence or absence of street lighting
- Proximity to designated pedestrian crossing
- Drainage
- Utility access points
- Proximity to sensitive noise receptors
- Existing roadway signage

The primary reference for design standards for speed humps and their associated pavement markings and signage is the US Department of Transportation Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD provides guidance for proper signage and line striping as well as guidelines for appropriate sign spacing. Specific references are included at the end of this document.

Section 2C.04	Placement of Warning Signs
Section 2C.27	Speed Hump Sign (W17-1)
Section 3B.29	Speed Hump and Speed Table Markings

Engineering judgement needs to be applied when placing speed humps and the associated signs in a village setting. Frequent homes, driveways and other roadside features tend to dictate the optimum locations that both best serve the purpose and result in the fewest negative impacts. There is ample flexibility in the placement and design guidance to adjust each installation to best fit its surroundings.



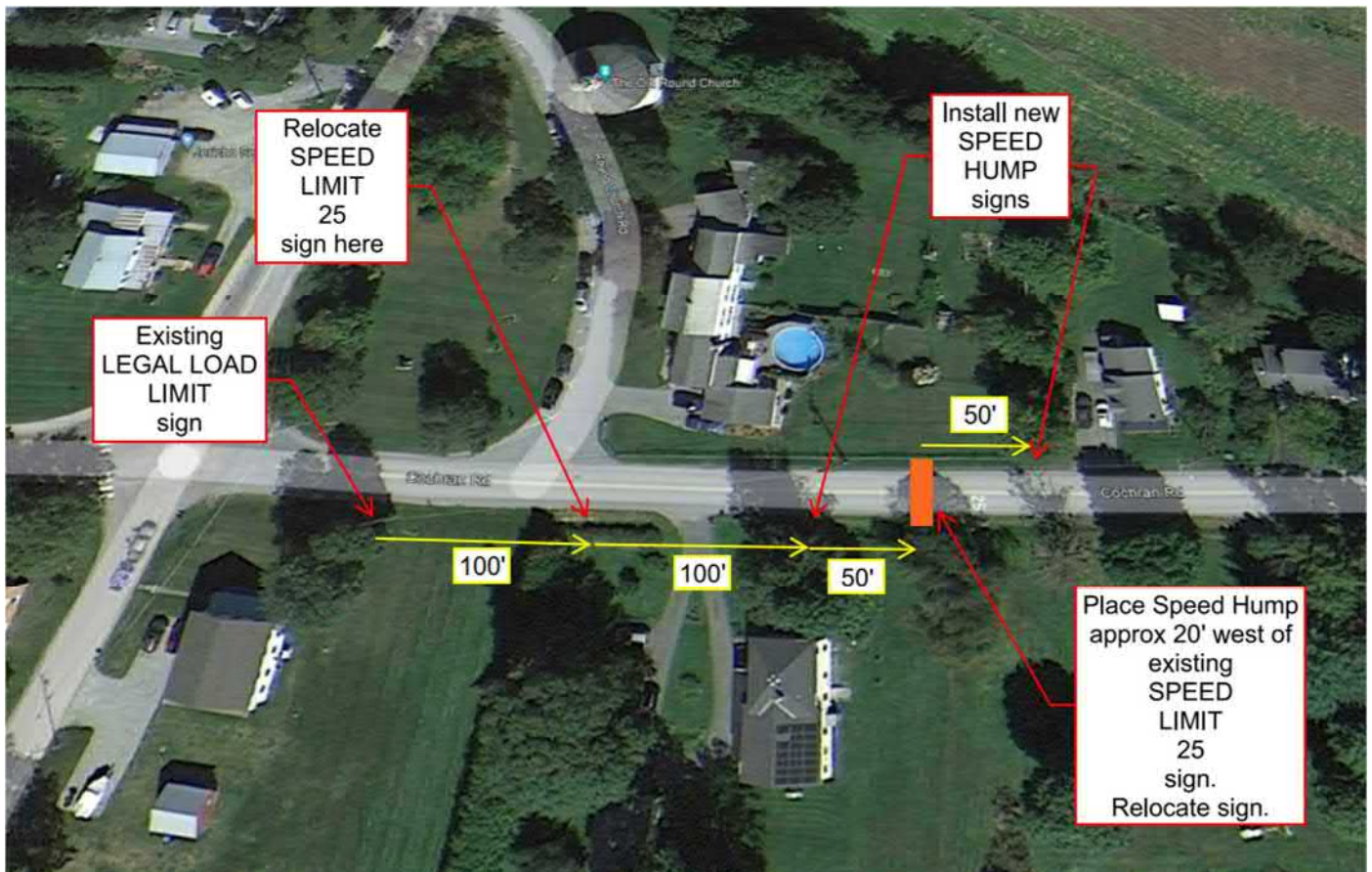
W17-1

The installation of temporary speed humps will allow for easy adjustments based on observed operation and effectiveness prior to making a decision on a more permanent solution.

WESTERN END RECOMMENDATION

Based on the field review with the Town and CCRPC, the goal is to slow traffic coming onto Cochran Road from Huntington Road as close to the intersection with Bridge Street as possible. Respecting the minimum recommended distance from an unsignalized intersection, the closest location would be approximately 150' east of Round Church Road. This location is well spaced from adjacent driveways and is relatively equally spaced from adjacent homes, making it a reasonable choice.

Sign spacing works well in this location, allowing the existing Legal Load posting sign to remain in place and still provide adequate warning of the upcoming Speed Hump. Sight distance is unrestricted in both directions. The recommended signs and spacing is illustrated in the figure below.

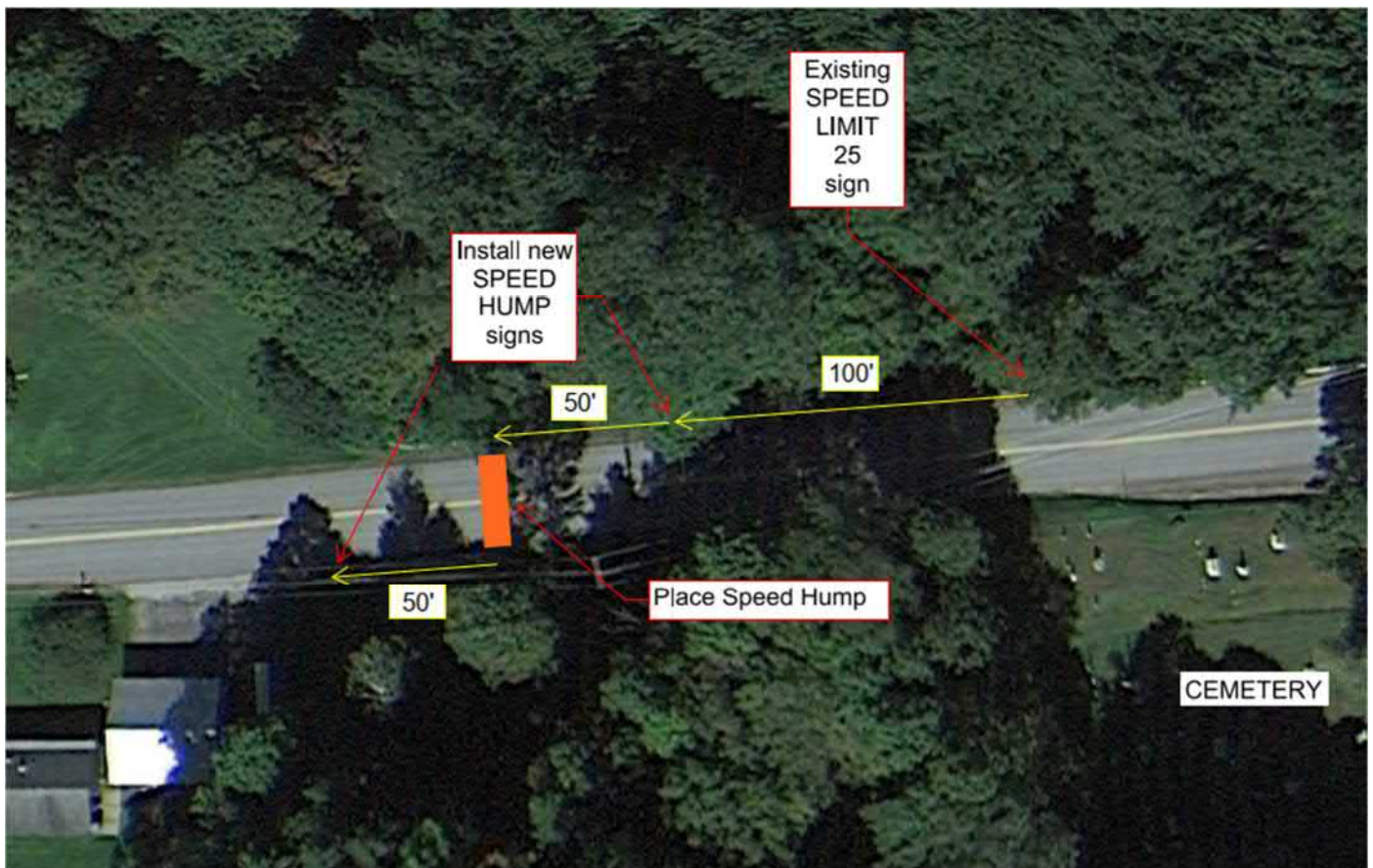


EASTERN END RECOMMENDATION

Based on the field review with the Town and CCRPC, the goal is to slow the traffic leaving the 45 MPH Speed zone to the posted 25 MPH Speed Limit as soon as possible and prior to the first adjacent residences.

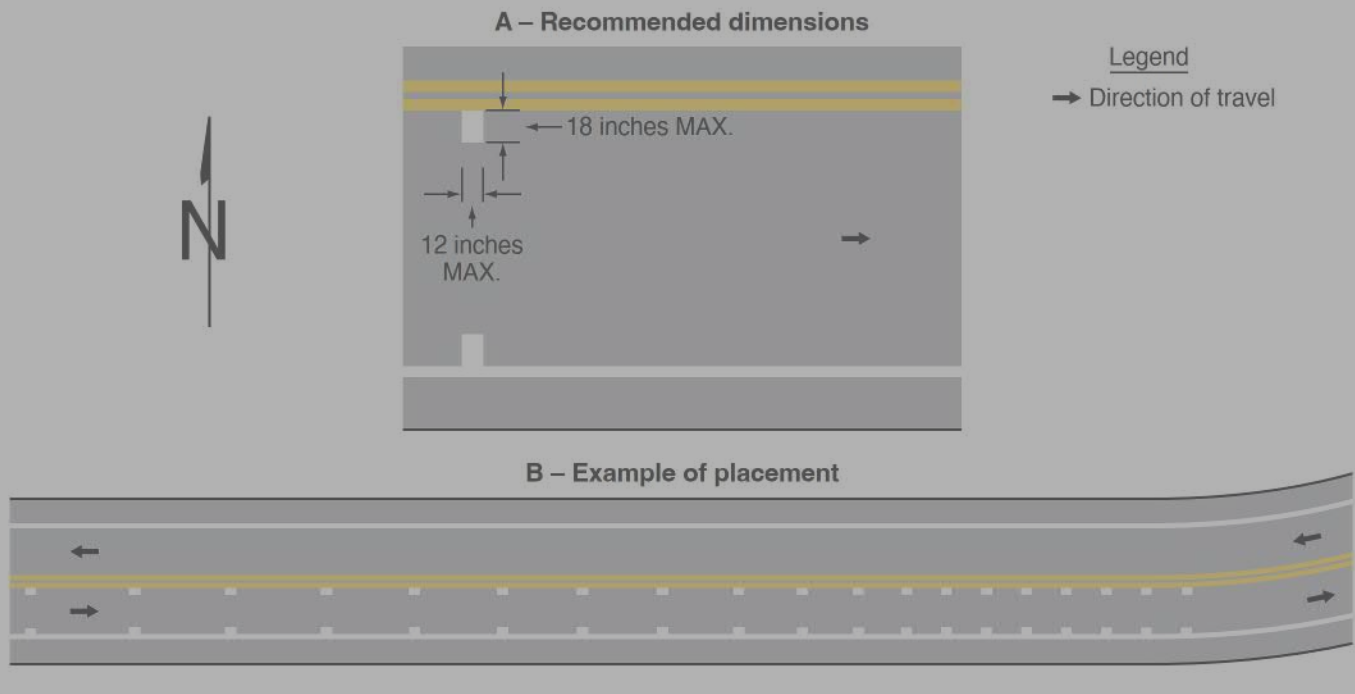
In the transition area between the 45 MPH and 25 MPH zones is St. Mary's Cemetery. Approaching from the east, the roadside parking by the cemetery is a visual prompt that drivers are approaching a roadside context change. In addition, just west of the start of the speed zone is an area where the roadside features are closer to the road, making the road feel more narrow. Both of these conditions should cause a driver to naturally want to slow down, so the placement of a speed hump there may be even more effective than if the roadside environment were more open.

There are no nearby intersections and sight distance is unrestricted in both directions. Maintaining the 25 MPH Speed Limit sign in its existing location, the Speed Hump can be placed in the narrowed section and still provide adequate offset from the first driveway. The recommended signs and spacing is illustrated in the figure below.



MUTCD REFERENCES

Figure 3B-25. Example of the Application of Speed Reduction Markings

*Guidance:*

- 04 If used, speed reduction markings should be reserved for unexpected curves or other usages based on engineering judgment. Speed reduction markings should not be used on long tangent sections of roadway or in areas frequented mainly by local or familiar drivers, such as school zones. If used, speed reduction markings should supplement the appropriate warning signs and other traffic control devices and should not substitute for these devices.

Standard:

- 05 Speed reduction markings shall be a series of white transverse lines on both sides of the lane that are perpendicular to the center line, edge line, or lane line.

Guidance:

- 06 The longitudinal spacing between the markings should be progressively reduced from the upstream to the downstream end of the marked portion of the lane.
- 07 Speed reduction markings should not be greater than 12 inches in width, and should not extend more than 18 inches into the lane.

Standard:

- 08 Speed reduction markings shall be used only in lanes that have a longitudinal line (center line, edge line, or lane line) on both sides of the lane.

Section 3B.29 Speed Hump and Speed Table Markings**Standard:**

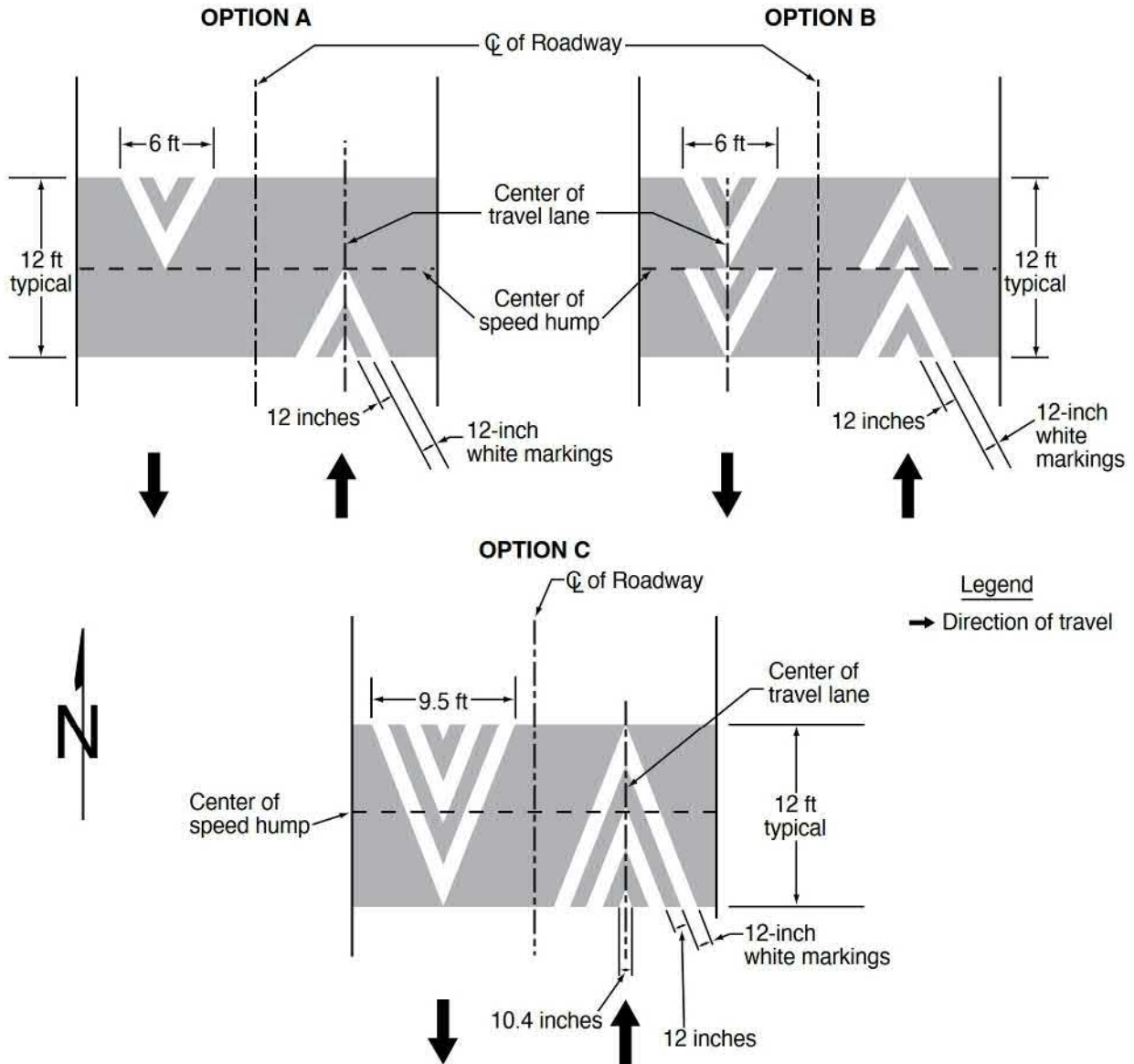
- 01 If speed hump markings are used, they shall be a series of white markings placed on a speed hump to identify its location. If markings are used for a speed hump that does not also function as a crosswalk or speed table, the markings shall comply with Option A, B, or C shown in Figure 3B-26. If markings are used for a speed hump that also functions as a crosswalk or speed table, the markings shall comply with Option A or B shown in Figure 3B-27.

Option:

- 02 Where used, center line markings, lane line markings, and edge lines may be discontinued on the profile of the speed hump.

Standard:

- 03 Where a speed hump or a speed table specifically incorporates a crossing movement for pedestrians, bicyclists, or equestrians, and functions as a raised crosswalk, crosswalk markings (see Chapter 3C) shall be provided.

Figure 3B-26. Pavement Markings for Speed Humps without Crosswalks**Section 3B.30 Advance Speed Hump and Speed Table Markings**

Option:

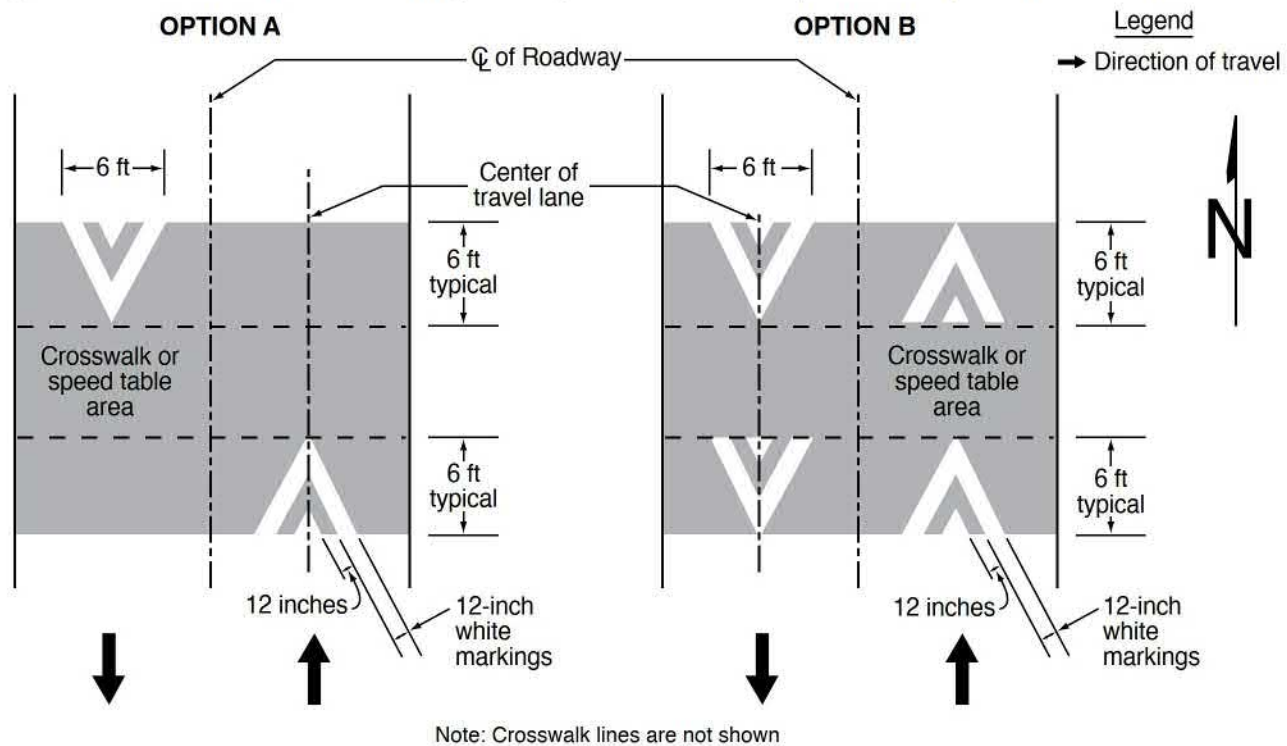
- 01 Advance speed hump markings (see Figure 3B-28) may be used in advance of speed humps or other engineered vertical roadway deflections such as dips where added visibility is desired or where such deflection is not expected.
- 02 Advance word pavement markings such as BUMP or HUMP (see Section 3B.20) may be used on the approach to a speed hump either alone or in conjunction with advance speed hump markings. Appropriate advance warning signs may be used in compliance with Section 2C.27.

Standard:

- 03 **If advance speed hump or speed table markings are used, they shall be a series of eight white 12-inch transverse lines that become longer and are spaced closer together as the vehicle approaches the speed hump or other deflection. If advance markings are used, they shall comply with the detailed design shown in Figure 3B-28.**

Guidance:

- 04 *If used, advance speed hump markings should be installed in each approach lane.*

Figure 3B-27. Pavement Markings for Speed Tables or Speed Humps with Crosswalks**Section 3B.31 Markings for a Diamond Interchange with a Transposed Alignment Crossroad**

Support:

- 01 Markings used in a diverging diamond interchange with a transposed alignment crossroad can be advantageous for minimizing wrong-way movements. The potential for wrong-way movements is greatest at the crossover intersections where the alignment becomes transposed.

Standard:

- 02 **On the transposed alignment, each direction shall be considered a one-way roadway whereas the edge line convention shall be in accordance with Section 3B.09. Both yellow and white lines shall be used.**
- 03 **A lane-use arrow (see Section 3B.23) shall be used in each approach lane at the crossover intersection.**

Support:

- 04 Section 3C.11 contains information on crosswalks and pedestrian movements for diverging diamond interchanges with a transposed alignment crossroad.

Standard:

- 05 **Flush median islands (see Section 3J.03) shall not be used to divide the inverted flow of traffic.**

Guidance:

- 06 *Edge line and lane line extensions (see Section 3B.11) should be provided through the crossing points.*

Support:

- 07 Figure 3B-29 illustrates an example of pavement markings for a diverging diamond interchange with a transposed alignment crossroad.

Figure 3B-28. Advance Warning Markings for Speed Humps or Speed Tables

