Measure Name: Speed hump

Definition: A raised section of roadway pavement surface extending across the travel lane perpendicular to the direction of travel to reduce motorist travel speeds.

Tags:

Type of Incident:

- ☐ Non-Motorized Users Only
- ☒ Motor Vehicles Only
- ☐ Both

Intervention Strategy:

- ☐ Data: application and planning
- ☐ Education: outreach and messaging
- ☐ Enforcement: policy development and rulemaking
- ☒ Engineering: technological and physical deterrents

Type of Problem:

- ☐ Non-Motorized Users Violating Warning Devices
- ☒ Motor Vehicles Violating Warning Devices
- ☐ Vehicle ROW Incursion
- ☐ Vehicle Congestion
- ☐ Blocked Crossing
- ☐ Vehicle Hang-up

Measure Category:

- ☐ Risk Assessment
- ☐ Policy and Enforcement
- ☐ Collaboration, Training, and Education
- ☐ Public Communication
- ☐ Physical Barriers
- ☐ Detection and Lighting
- ☒ Infrastructure Modification
- ☐ Post-Incident Management
- ☒ Warning Devices

Description

A speed hump is a raised section of roadway pavement extending across a travel lane perpendicular to the direction of travel. A speed hump provides a more gradual vertical deflection than a speed bump and does not limit the speed as severely as a speed bump [1]. Typically, a speed hump is approximately 10 to 14 feet long and 3 to 4 inches high [2]. Speed humps can reduce road vehicle speed. When installed on the approach to a highway-rail grade crossing, a speed hump is intended to alert the driver of the crossing and maximize the time available to the driver to properly adjust driving behavior [3].

Studies have indicated that speed humps have been found to significantly reduce vehicle travel speeds; the typical 85th percentile vehicle speed after implementation of a speed hump is about 27 mph [4]. Reduced vehicle speeds maximize the time available for the driver to process information and adjust driving behavior to suit the conditions of the crossing. Speed humps can increase compliance with traffic control devices at crossings and decrease collisions.

Speed humps are suitable for reducing speeds on local streets and residential collector streets. However, they are generally not recommended for installation of major routes, especially those on bus routes or emergency vehicle routes, because passenger safety and emergency response times can be harmed [5]. Delay for a fire truck is typically 3-5 seconds and delay for an ambulance with a patient can be up to 10 seconds [6].

Additional search terms: *traffic calming, speed reduction, speed bump*

Advantages

- Reduces the average speed of drivers when approaching a highway-rail grade crossing and improves detection of crossing. [4] [7]
- Little infrastructure modification required to deploy, and prefabricated speed humps can easily be deployed or removed when necessary. [7]
- Inexpensive compared to other traffic calming measures. [6]

Drawbacks

- Can delay response time of emergency vehicles. [6]
- Vertical deflection can be hazardous to passengers on transit vehicles. [4]
- Can cause damage to or be damaged by snow removal equipment. [4]
- Noise levels may increase on roadways with significant commercial traffic. [6]
- Often have poor user acceptance, especially of nearby residents. One study indicated that approximately half of nearby residents found the installation of speed hump near a crossing very unpleasant. [8]

Notable Practices

- Minimizing delays to emergency response and transit routes should be prioritized. Alternative techniques include focusing on education and enforcement initiatives instead of engineering measures, or using measures that accommodate emergency vehicles, such as speed cushions that can be straddled by many emergency vehicles [5]. Coordinating designs with fire departments and transit agencies can be valuable when implementing traffic calming plans. [3]
- Layout should consider preventing driving around the speed hump. Techniques including deploying over lanes in both directions of travel and using other physical barriers. [2]
- Evaluation should be performed to determine the proper distance from the crossing to prevent distraction. [2]

References

[1] Federal Highway Administration. (2023). Manual on Uniform Traffic Control Devices.

> Excerpt: The purpose of the MUTCD is to establish uniform national criteria for the use of traffic control devices that meet the needs and expectancy of road users on all streets, highways, pedestrian and bicycle facilities, and site roadways open to public travel.

[2] Bagdade, J., et al. (2012). Speed Management: A Manual for Local Rural Road Owners. Technical Report No. FHWA-SA-12-027. Washington, DC: U.S. Department of Transportation, Federal Highway Administration.

> Abstract: In 2010, 35 percent of the 30,196 fatal crashes on U.S. roadways occurred on local rural roads, with nearly one-third (3,427) of these involving speeding. This document is intended to provide local road practitioners with information on how to address speeding-related crashes through the implementation of a comprehensive Speed Management Program. An effective program addresses all factors that influence speeding through engineering, enforcement, education, and emergency services—known as the four E's of safety.

[3] SAFER-LC. (2018, October 31). Definition Of New Human Centred Low-Cost Countermeasures.

> Excerpt: This deliverable describes the methods applied and the results achieved during the first phase of Task 2.3 within the SAFER-LC project: the design of new human-centred low-cost measures to improve safety at level crossings (LCs). The European project SAFER-LC – Safer level crossing by integrating and optimizing road-rail infrastructure management and design – aims to improve safety in road and rail transport by minimising the risk of LC accidents, focusing on both technical solutions and human processes. Within the project, the objective of Work Package 2 (WP2) is to enhance the safety performance of level crossing infrastructures from a human factors perspective, making them more self-explaining and forgiving.

[4] Federal Highway Administration. Traffic Calming ePrimer.

> Description: The Traffic Calming ePrimer is a free, online resource openly available for public use. The ePrimer presents a thorough review of current traffic calming practice and contains the information needed to understand this complex field. The ePrimer is presented in eight distinct modules developed to allow the reader to move between each to find the desired information, without a cover-to-cover reading.

[5] Parkhill, M., et al. (2007). Updated Guidelines for the Design and Application of Speed Humps. Institute of Transportation Engineers.

Excerpt: To update the ITE speed humps recommended practice, the experiences of agencies implementing speed humps were obtained through an extensive literature review. The literature review was supplemented with an online survey targeting North American and international jurisdictions.

[6] Institute of Transportation Engineers. (1999). Traffic Calming: State of the Practice ITE/FHWA, August 1999.

Excerpt: This report contains data collection and synthesis of traffic calming experiences to date in the United States and Canada. It includes information on traffic calming in residential areas and areas where high speed rural highways transition into rural communities. The report draws detailed information collected on traffic calming programs in twenty featured communities, another 30 communities surveyed less extensively, and a parallel Canadian effort by Canadian ITE (CITE) and Transportation Association of Canada (TAC). The intended audience is transportation professionals.

[7] SAFER-LC. (2019, April 9). Speed Bumps on Approach to LC.

Description: This webpage provides information on implementing speed bumps on the approach of level crossings in Europe, including benefits, criticalities, recommendations, and results of relevant studies.

[8] Seise, A., Kallberg, V-P., & Silla, A. (2010). The effect of speed bumps on driving speeds at road-railway level crossings. 11th International Level Crossing Symposium. 97.

Excerpt: The main objective of this study was to investigate how speed bumps at level crossings of gravel roads affect approach speeds of road vehicles. Other objectives concerned the durability of the fastening of the bumps and the opinions of road users and road maintenance workers.

Additional Resources

Rothman, L., et.al. (2015). Installation of speed humps and pedestrian-motor vehicle collisions in Toronto, Canada: a quasi-experimental study.

Excerpt: Evidence related to the effectiveness of speed humps on reducing pedestrian-motor vehicle collisions (PMVC) has been conflicting. The purpose of this study was to determine the association between speed hump installation and changes in PMVC rates in Toronto, Canada.

Related Measures

- Transverse rumble strips

Images

- No image available