Traffic Calming Mitigation Measures

An Online Continuing Education Course for Engineers

Course Number: T-1010

Credit: 1 Hours / 1 PDH / 1 CPD

Traffic Calming Mitigation Measures

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Introduction

Traffic calming is the practice of designing safe roadway facilities that promote usability and livability through residential and commercial spaces. Over the past couple of decades, the integration of vehicles, pedestrians, and bicyclists along newly constructed and reconstructed multi-modal street networks has traffic engineers and urban planners strategizing on how to encourage responsible driving habits. When applied and installed correctly, traffic calming has been shown to reduce vehicle speeds and volumes, as well as, foster a healthy and secure travel way for all users. Traffic calming measures come in many forms, including:

- Horizontal
- Vertical
- Lane Narrowing
- Roadside
- Enforcement

History

Traffic calming was introduced in the 1930s in the United Kingdom, where pedestrian safety was at the forefront and maintaining vehicle traffic flow was secondary. Noise and air pollution that was generated by vehicles were deemed unhealthy. However, engineers still found it necessary to develop ways to incorporate vehicles and pedestrians into the same street network. Traffic calming initiatives grew out of this concept, including early measures like narrowed roads and speed humps.

Findings

The following key statistics from 2022 regarding speed-related crashes were compiled by the U.S. Department of Transportation's National Highway Traffic Safety Administration's (NHTSA) National Center for Statistics and Analysis.

- 28% of fatal crashes, 12% of injury crashes, and 8% of property damage-only crashes were speed-related.
- There were 12,151 fatalities due to speeding, which was 29% of total fatalities for the year. Represented a decrease of 3% from 12,498 in 2021.
- There were approximately 300,000 people injured due to speeding, which was 13% of total injuries.

- 35% of male drivers and 19% of female drivers in the 15-20 age group were involved in speed-related fatal crashes. Represented the highest among all age groups.
- 35% of motorcyclists were involved in speed-related fatal crashes, which was more than any other vehicle type.
- 87% of speed-related fatalities were on non-interstate roadway facilities.

Benefits

The benefits of traffic calming cannot be overstated as, at the end of the day, we want lives to be saved and surrounding communities to be safe and livable. Traffic engineers engage with local government agencies, residents, and businesses to determine what would be the best and optimal traffic calming measure to keep pedestrians, bicyclists, and even motorists protected. Once implemented, some of the benefits include reduced vehicle speeds, a decrease in crash severity, lower injury severity for pedestrians/bicyclists/motorists, minimal cut-through traffic, and increased property values.

Residential areas gain confidence that their streets see a reduction in vehicle speeds and volumes while their children play safely in their front yards and along their sidewalks. Commercial areas profit from increased foot traffic traversing roadways to access their businesses.

Reducing vehicle speeds is at the crux of determining the validity of a traffic calming measure. Slowing vehicles down is important in lessening the severity of pedestrian and bicyclist injuries, as well as the potential for fatalities. A vehicle traveling at a speed lower than 25 MPH is less likely to permanently injure a pedestrian or bicyclist upon impact. A vehicle traveling at a speed greater than 30 MPH is more likely to cause a pedestrian or bicyclist fatality upon impact. Figure 1 illustrates this correlation below.

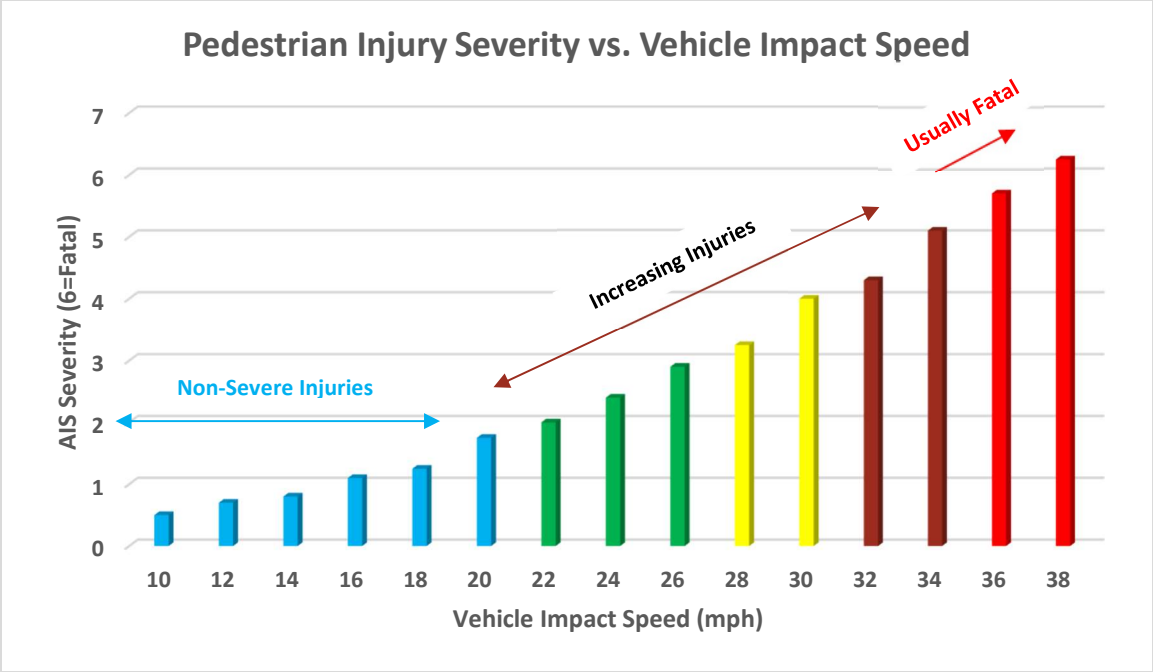


Figure 1: Vehicle Speed/Pedestrian Injury Correlation
Source: C.E. "Rick" Chellman

Traffic Calming Measures

Traffic calming measures come in a variety of forms, as previously mentioned, including horizontal, vertical, lane narrowing, roadside, and enforcement. Traffic studies are typically performed based upon an initial request by a residential neighborhood or business community due to a perceived speed problem or increased traffic volumes. Upon completion of the study, recommendations are formulated based on the results. If vehicle speeds are collected and determined that they are higher than the posted speed limit, then a speed deterrent measure(s) will be investigated. If traffic volumes are deemed higher than normal through a neighborhood from a license plate survey or origin-destination study, then a cut-through traffic deterrent measure(s) will be explored.

There is a whole toolbox of traffic calming devices that can be utilized, and some are more effective than others depending on the type of driver action trying to be limited. Below are several, but not limited to, traffic calming measures that have been implemented worldwide to help make communities safer and more livable.

1. Chokers

A choker consists of the horizontal extension of the curb line into the street. This extension would be on both sides of the roadway in order to narrow down the section to help slow down traffic. The driver's perception that the roadway is at a minimal width forces them to reduce their speed. They are typically

utilized at midblock locations or intersection corners. Chokers also assist in reducing the crosswalk width for pedestrians when crosswalk markings are present.

Traffic Choker in Canada
Source: Wikimedia Commons / Richard Drdul

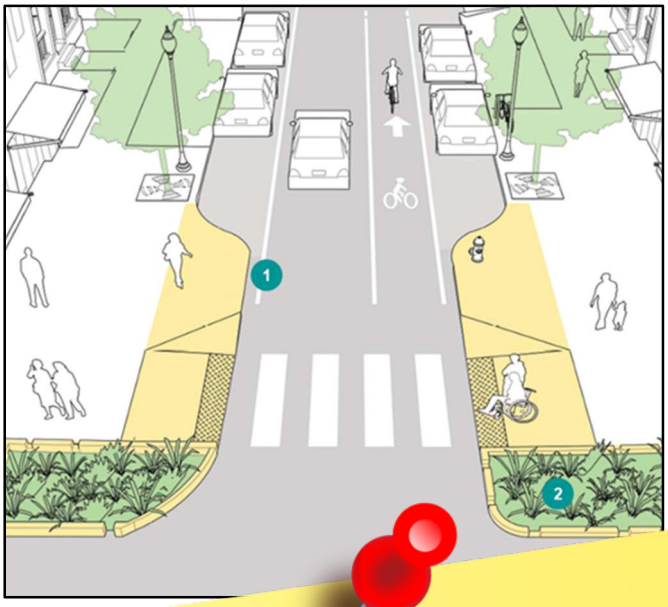
2. Chicanes

Chicanes are curb line extensions into the street or isolated, detached curb islands that create a zig-zag pattern along a stretch of roadway. The idea is to remove the straight-line path of a driver and force them to slow down in order to maneuver from side to side through the traffic pattern. Roadways with low traffic volumes and speed limits would benefit from this measure. Chicanes require a minimum street width (curb line to curb line) of 20 feet for emergency access. An acceptable minimum width is 28 feet if on-street parking is to be maintained.

Chicane in Seattle, Washington
Source: Wikimedia Commons / Richard Drdul

3. Intersection Bulb Outs

Intersection bulb-outs are similar to chokers in that they constrict the roadway width in order to reduce the speeds of vehicles. They also allow for shorter crossing distances for pedestrians at marked intersections. Bulb-outs serve the purpose of slowing down vehicles' turning speeds particularly at intersections that had previously wide turning radii. The challenge of bulb-outs is to ensure that truck and bus traffic that frequent the intersection are able to negotiate turns without running over the side of the curb line. Auto-turning software should be utilized to correctly size the tighter turning radii.



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4. Speed Hump

Speed humps are rounde eds along a stretch of roadway. They n and are accompanied by speed hu nge in width of 12 to 14 feet. This esigned to reduce vehicle speeds dow 250 to 350 feet, with 500 feet being th ed up too much between humps but a distance. Speed humps shou or less, or the 85th percentile speed i on and frequency should be planned e not adversely affected.

Speed humps should not be m bumps. Speed bumps are shorter in width and can create a jolting effect on vehicles upon contact.