Traffic calming

INSTITUTE OF TRANSPORTATION ENGINEERS

Traffic calming involves altering of motorist behavior on a street or on a street network. It also includes traffic management, which involves changing traffic routes or flows within a downtown district or neighborhood. Traffic calming also involves installation of barriers, and other physical measures to reduce traffic speeds and/or cut-through volumes, in the interest of street safety, livability, and other public purposes. Finally, traffic calming consists of operational measures such as enhanced police enforcement, speed displays, and a community speed watch program.

A person hit by a vehicle traveling 53.1 km/h (33 mi/h) has an 80 percent likelihood of death or serious injury, while 32.2 km/h (20 mi/h), the likelihood drops to 35 percent.

Pedestrian Head-Start Phasing

Pedestrian head-start phasing, also known as pedestrian lead-in phasing, provides a walk phase to pedestrians prior to providing parallel vehicle traffic with a green light. All directions of traffic see a brief all red phase during this time. Head start phasing is most appropriate to consider in intersections with heavy combinations of pedestrian traffic and right and left turning vehicles across the crosswalk. Pedestrian push button or passive sensors can activate it, and it can be traffic-flow dependent (i.e., not activated during periods of light traffic flow when the frequency of turning vehicles is low). The advanced technology aspect involves the incorporation of passive sensors to activate the system only when a pedestrian is at curbside.

Considerations

Benefits

1. For those signalized intersections where pedestrians frequently cannot get out onto the crosswalk due to heavy, aggressive right turning traffic, the head start allows pedestrians to establish themselves in the crosswalk before right turning traffic can begin moving.
2. This technology can be installed at most intersections without advanced technologies. The use of passive sensors with this technology would mean the pedestrian phase is only activated when pedestrians are present and would provide nearly 100 percent pedestrian detection. In addition, the amount of pedestrian phase time is limited to the amount necessary for pedestrians to cross, which may contribute to reduced congestion.

Concerns

1. Older traffic signals, particularly fixed time signals in cities, may require new controllers at substantial increases in cost to accommodate this technology.

Potential Safety Benefits

This technology is principally beneficial in decreasing pedestrian-vehicle conflicts by allowing pedestrians to establish themselves in the crosswalk before vehicles are shown a green light. The addition of a passive pedestrian sensor to such systems may serve primarily to prolong a green phase in the absence of pedestrians, but the likelihood of the technology improving the safety of pedestrians cannot be known until further studies are conducted.

Exclusive Pedestrian Phasing
Or
Pedestrian Scramble

Exclusive pedestrian phasing, also called "pedestrian scramble," has been generally used in a number of downtown areas with large concentrations of pedestrians using a manual call button. The exclusive pedestrian phase stops all vehicular movement and allows pedestrians access to cross in any direction at the intersection, including diagonally. An exclusive pedestrian phase that incorporates advanced technology would be able to recognize the conditions under which the pedestrian phase would be appropriate based on such factors as time of day, vehicle volume, pedestrian presence, etc. The system would activate when the pedestrian phase is activated, either by pedestrians pushing a button or by being passively detected by sensors, and during conditions that would not create or contribute to congestion. Pedestrian phase activation could be further refined to prohibit pedestrian-vehicle conflicts in crosswalks (e.g., prohibiting all turns) and allowing other non-conflicting vehicle movements to occur or continue in tandem with the activation. Although exclusive pedestrian phasing has been widely deployed, the advanced technology aspect of this system is in the concept development phase and needs further conceptual evaluation before moving forward.

An alternative to the exclusive pedestrian phase concept is to prohibit left and right turning vehicles moving in parallel to the crosswalk from turning when a pedestrian is detected in the crosswalk by a passive pedestrian sensor. This system activates LED turn prohibition signs when pedestrians are detected.

Considerations

Benefits

1. The technology to apply exclusive pedestrian phases has been widely used and is readily available for installation.
2. In general, exclusive pedestrian signal phasing is a low cost and effective tool to improve safety and remove the potential for automobile and pedestrian conflicts.

Raised Crosswalks

Raised crosswalks are Speed Tables outfitted with crosswalk markings and signage to channelize pedestrian crossings, providing pedestrians with a level street crossing. Also, by raising the level of the crossing, pedestrians are more visible to approaching motorists.

Raised crosswalks are good for locations where pedestrian crossings occur and vehicle speeds are excessive.

Advantages:

- Raised Crosswalks improve safety for both pedestrians and vehicles
- If designed well, they can have positive aesthetic value
- They are effective in reducing speeds, though not to the extent of Speed Humps

Effectiveness:

- For a 22-foot Speed Table (the most similar device for which data is available):
  - Average of 18% decrease in the 85th percentile travel speeds, or from an average of 36.7 to 30.1 miles per hour; (from a sample of 58 sites).
  - Average of 45% decrease in accidents, or from an average of 6.7 to 3.7 accidents per year (from a sample of 8 sites).

Cost Estimate(s):

- $4,000

Speed Tables...(trapezoidal humps, speed platforms)

Speed tables are flat-topped speed humps often constructed with brick or other textured materials on the flat section. Speed tables are typically long enough for the entire wheelbase of a passenger car to rest on the flat section. Their long flat fields give speed tables higher design speeds than Speed Humps. The brick or other textured materials improve the appearance of speed tables, draw attention to them, and may enhance safety and speed-reduction.

Speed tables are good for locations where low speeds are desired but a somewhat smooth ride is needed for larger vehicles.

Advantages:

- They are smoother on large vehicles (such as fire trucks) than Speed Humps.
- They are effective in reducing speeds, though not to the extent of Speed Humps.

Effectiveness:

- For a 22-foot speed table:
  - Average of 18% decrease in the 85th percentile travel speeds, or from an average of 36.7 to 30.1 miles per hour; (from a sample of 58 sites).
  - Average of 45% decrease in accidents, or from an average of 6.7 to 3.7 accidents per year (from a sample of 8 sites).

Cost Estimate(s):

- $2,000-$2,500 (Portland, OR)
- $2,000 (Sarasota, FL)
- $2,000 (Seattle, WA)