



Pedestrian Crossing and Traffic Calming

Photo Credit: EBA Engineering

Melanie
Messier

Street crossings should incorporate aspects of safety, mobility and accessibility for all pedestrians. Individuals with a range of levels of mobility all benefit from inclusive and universal design that are considerate of all abilities. Pedestrian crossing treatments are being applied in variety of circumstances and combinations⁶. Pedestrian crossing treatment examples include raised median islands, curb extensions, rectangular rapid flash beacons (RRFB's), pedestrian hybrid beacons (PHB's) and more. The initiative for transportation system designers is to consider the safety of pedestrians and minimize the chances of injury or death. Mandates are being adopted by communities to improve the pedestrian realm including Toward Zero, Vision Zero and Complete Streets frameworks. Traffic calming would appear to have considerable potential for promoting walking and bicycling².

Toward Zero, Vision Zero and Complete Streets aim to provide safer and better-connected streets to communities⁶

NACTO, Design Controls

Roadway design falls into two categories:

Passive Design better serves traffic congestion or drivers travelling at higher speeds, essentially roads that are catered to motor vehicles. Characteristics of passive design roadways that encourage unsafe speeds and vehicle collisions include⁴: (Figure 1)

- Overdesigned buffers
- Setbacks
- Clearzones

Proactive Design allows humans to adapt to their environment and guide user behaviour through physical and environmental cues⁴. Objectives of proactive design include:

- Improved visibility between pedestrian and driver
- Shortened crossing distances
- Reduced vehicle speeds



Photo Credit: The Columbian
Figure 1: Intersection in Washington with a high presence of motor vehicles and minimal pedestrian activity.

NCHRP, Pedestrian Calming Treatments for Streets and Highways

Traffic Calming can be described as an overall transport policy, a reduction of average motor vehicle speed in built up areas and a strong promotion of



Figure 2: Curb radius reduction



Figure 3: Midblock median island located in Port Townsend, WA

pedestrian, public and bicycle transport(p.1)³. Policies dedicated to traffic calming and different methods to improve unsafe streets include the city of Toronto's Traffic Calming Guide and the National Association of City Transportation Officials' Urban Street Guide Design.

Challenges for cities include determining where is appropriate to install street calming methods and determining which are most effective. Calming methods are being applied in different scenarios including residential streets with low vehicle volumes and major arterial roads that have vehicle capacities of greater than 20,000 per day. A major concern for cities **are whether they are able to apply traffic calming measures on major roads**. Traffic speed plays a vital role in increasing the chances of vehicular-pedestrian collisions. Road safety seeks to reduce the speed of motor traffic to 30kph or below in built up areas³.

Pedestrian and vehicular collisions at speeds of:

- 70 kph likelihood of fatal injuries to pedestrian is **83%**
- 50 kph likelihood of fatal injuries is **37%**
- 30 kph likelihood of fatal injuries is **5%**

City of Toronto, Traffic Calming Guide

Road classification systems are beneficial in determining which traffic calming measures are appropriate at different speeds the function of roads. A road classification table can be found in reference¹(p. 8).

- Local Roads (speed 30-50) volume less than 2,500/day
- Collector Roads (speed 30-50) 2,500 - 8000/day
- Minor Arterial Roads (speed 40-60) 8,000 - 20,000/day
- Major Arterial Roads (speed 50-60) Greater than 20,000

Toronto has mandated to make improvements that are effective in increasing road safety. Design strategies for improving major arterial roads included:

- Curb radius reduction: (Figure 2)
- Raised median islands: (Figure 3)
- On-street parking: (Figure 4)

Alternatives to traffic calming offered by the city of Toronto include a posted speed limit reduction and police enforcement.

“In 2011, 4,432 pedestrians were killed and 69,000 injured in motor vehicle crashes. Of the fatalities, 73% were in urban areas”⁴



Figure 4: On-street parking in Wilmette, Illinois

Figure 5:
Street lacking
options to
cross at mid-
sections

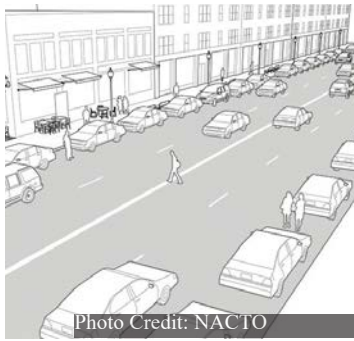


Figure 6:
Midblock
raised
crosswalk



**“Intersections
are a critical
aspect of street
design as the
point where
motorist, bicycle,
and pedestrian
movements”²**

NACTO, Urban Street Design Guide

Crosswalks should measure both existing and projected crossing demand⁴. The result of not offering safe options for crossing is pedestrians taking unsafe measures and discourages walking. Walkability of a city is enforced by offering frequent and controlled crosswalks that are appropriate for the site.

Types of crosswalks and crossings include:

Conventional crosswalks: *Not pictured*

- Keep crossing distances as short as possible
- High visibility ladder for crosswalks

Midblock crosswalks: **(Figure 6)**

- Install where there is pedestrian need
- Install vertical elements such as trees for identification

Pedestrian safety islands: **(Figure 7)**

- Applies to both narrow and wide streets
- Can be installed in location with high speeds and high traffic volumes
- Minimum 6 foot width



Figure 7: Pedestrian safety
island located in Austin, TX

Final Thoughts

There are a variety of traffic calming methods for cities to improve the pedestrian realm. The risk of pedestrian-vehicle collisions is still a reoccurring issue especially at high speeds. Mandates such as Toward Zero, Vision Zero and Complete Streets are aiming to reach 0 pedestrian fatalities by motor vehicles. By lowering maximum speeds from 70kph to 30 kph the risk of fatal injuries drops from 83% to 5%. The lowering of speeds on major roads is a contentious subject for residents and travellers, although, traffic calming measures are an opportunity to provide positive changes. Passive design is a common method of transport planning although traffic calming is an opportunity to take proactive measures to provide safer and more accessible streets.

Sources:

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3. Hass-Klau, C. (1990). *An illustrated guide to traffic calming: the future way of managing traffic*. London.
4. NACTO (2018). *Urban street design guide*. Retrieved from <https://nacto.org/publication/urban-street-design-guide/>
5. Thomas, L., Thirsk, J., N., Zegeer, V., C. (2016). *Application of pedestrian crossing treatments for streets and highways (Synthesis of highway practice; 498)*.

Figure 1: Intersection in Washington. Retrieved from <https://www.columbian.com/news/2018/aug/14/state-to-remove-highway-500-signals/>

Figure 2: Curb radius reduction. Retrieved from http://pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=28

Figure 3: Mid-block median island in Port Townsend, WA. Retrieved from https://commons.wikimedia.org/wiki/File:Midblock_median_island.jpg

Figure 4: On-street parking in Wilmette. Retrieved from <http://howwedrive.com/2009/02/12/removing-lines-as-a-traffic-calming-measure-data-anyone/>

Figure 5: Midblock Crosswalks. Retrieved from <https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/midblock-crosswalks/>

Figure 6: Midblock Crosswalks. Retrieved from <https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/midblock-crosswalks/>

Figure 7: Pedestrian safety islands. Retrieved from <https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/pedestrian-safety-islands/>