

THE CORPORATION OF THE CITY OF WINDSOR PROCEDURE

Service Area:	Office of the City Solicitor	Procedure No.:	
Department:	Planning and Building Services	Approval Date:	
Division:	Transportation Planning	Approved By:	
		Effective Date:	On Approval
Subject:	Permanent Traffic Calming Procedure	Policy Ref.:	Traffic Calming Policy
		Pages:	Replaces:
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1. PURPOSE

- 1.1. This procedure is intended to provide details for reviewing traffic calming requests and implementing the Traffic Calming Policy using a warrant review process.

2. SCOPE

- 2.1. This procedure provides the details to address traffic calming requests for permanent traffic calming measures.

3. RESPONSIBILITY

- 3.1. Responsibility for implementing this procedure is outlined in the Traffic Calming Policy.

4. PROCEDURE

- 4.1. A traffic calming project is initiated when a resident, business or group submits a concern specifically related to vehicle speeds and/or volumes. Requests are usually submitted by contacting 311
- 4.2. There are four stages of a traffic calming project:
 Stage 1: Project Initiation (Section 4.5)
 Stage 2: Project Development (Section 4.6)
 Stage 3: Project Approval (Section 4.7)
 Stage 4: Project Implementation (Section 4.8)
- 4.3. A traffic calming project ends when a traffic calming solution is implemented or traffic calming is not appropriate for implementation.

4.4. Stage 1: Project Initiation

- 4.4.1. Upon receiving the request, the street will be evaluated for eligibility and must meet all of the following criteria, otherwise the review process ends:
- Local or Collector road in the City's Official Plan;
 - Longer than 150 m; and
 - Has not been evaluated for traffic calming in the last 3 years.
- 4.4.2. Administration will then determine the appropriate locations to collect speed and volume data. One of the following thresholds must be met, otherwise the street is reviewed for speed humps eligibility through the Local Roadway Speed Humps Procedure:
- A minimum 85th percentile speed of 10 km/h over the speed limit; or
 - A minimum volume of 1,000 vehicles per day (vpd) for local roadways; 3,000 vpd for Class II collector roadways and 6,000 vpd for Class I collector roadways.
- 4.4.3. A preliminary warrant review of speed, volume and pedestrian data may be undertaken to determine whether a warrant would be achievable. If it is determined the initial data would not meet warrant, the requestor may be referred to the Expedited Temporary Traffic Calming Procedure or the Local Roadway Speed Humps Procedure.
- 4.4.4. Administration will identify a survey area to survey the neighbourhood for support of initiating a traffic calming review. The survey area should include all residential households and commercial properties directly abutting the street of concern (excluding City-owned or vacant properties), up to 150 m on either side of the location of concern, or to the nearest intersection, whichever is closer. If the concern is at an intersection, the survey area should extend to the next cross street in each direction. Examples of survey areas are illustrated in **Figure 1**.
- 4.4.5. Administration will mail a letter to all households, residential units and commercial properties within the survey area, requesting participation in a telephone survey using the City's 311 system (or other means appropriate) to demonstrate neighbourhood support. **A minimum 25% must respond in favour of a traffic calming review.** If this threshold is not met, the review process for permanent traffic calming ends and the street is reviewed through the Local Roadway Speed Humps Procedure. A new traffic calming request within the same street segment may start from the survey stage if the traffic data collected for the previous request is still current.
- 4.4.6. Upon confirming neighbourhood support, a warrant/prioritization area will be identified, which should include local and collector roads bound by higher functioning roads, as illustrated in **Figure 2**.
- 4.4.7. A warrant review will be conducted using the points criteria identified in **Table 1**. Vehicle speeds are analyzed using the 85th percentile speed collected during a speed study. Volumes are analyzed using the measured annual average daily traffic (AADT) counts.

Figure 2 - Example of Warrant/Prioritization Area

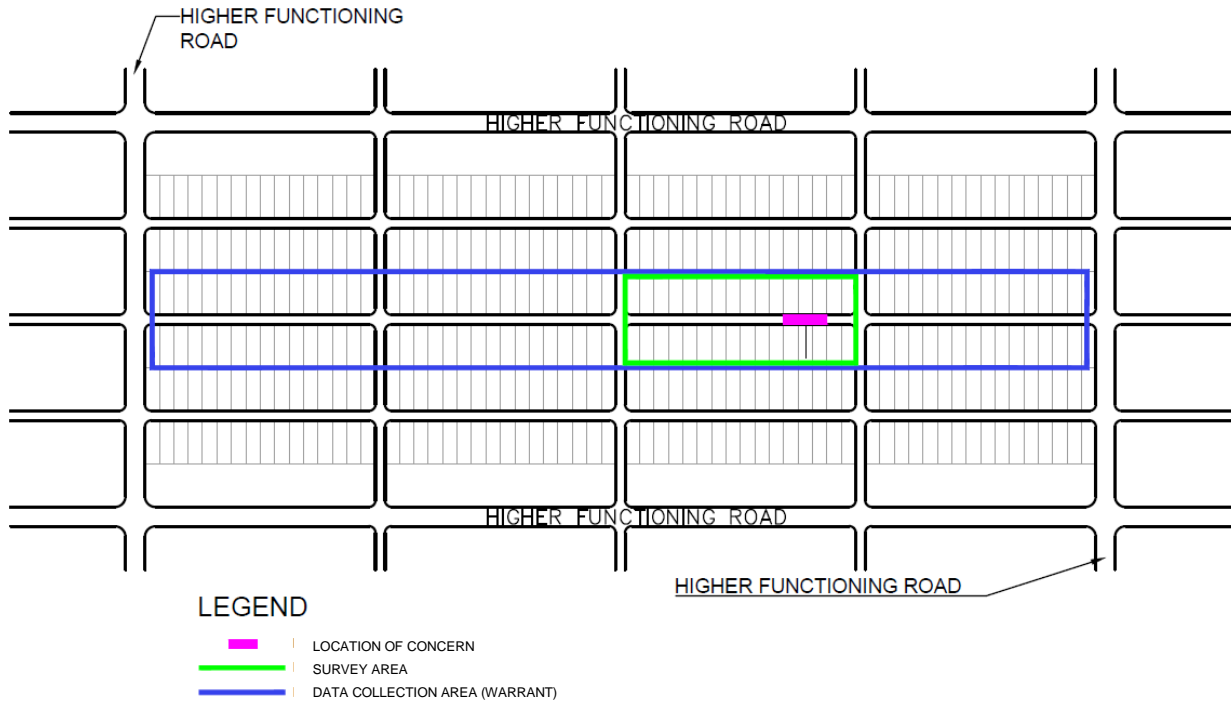


Table 1: Permanent Traffic Calming Warrant Review

Criteria	Points	Max. Points
LOCAL ROADS		
Vehicle Speeds	3 points for every km/h (85 th percentile) over the posted speed using the average along the street. Eg. average 85 th percentile speed: 58 km/h in a max. 50 km/hr zone = 24 points	30
Vehicle Volumes	1 point for every 100 AADT starting from 0. Eg. 1,500 AADT = 15 points	25
Presence of Schools	7.5 points for each school along the street and 5 points for designated school walk routes for schools near but not on the street itself.	15
Other Pedestrian Generators	5 points for each generator (park, senior's center, community centre, place of worship, retail or public institution excluding schools) with a direct connection to the street (frontage, trail, sidewalk or other access point).	10
Collisions	1 point for each reducible* collision per kilometer in the past five years plus 5 points for each reducible collision per kilometer involving a vulnerable road user within the past five years.	10
Presence of Sidewalks	5 points if the road does not have a continuous sidewalk on at least one side.	5
COLLECTOR ROADS		
Vehicle Speeds	2 points for every km/h (85 th percentile) over the posted speed limit using the average along the street. E.x. average 85 th percentile speed: 58 km/h in a max. 50 km/h zone = 16 points	30
Vehicle Volumes	1 point for every 100 AADT starting from 3,000 for Class II; 6,000 for Class I. E.x. 4,500 AADT on Class II = 15 points 7,500 AADT on Class I = 15 points	25
Presence of Schools	7.5 points for each school along the street and 5 points for designated school walk routes for schools near but not on the street itself.	15
Other Pedestrian Generators	5 points for each generator (park, senior's center, community centre, place of worship, retail or public institution excluding schools) with a direct connection to the street (frontage, trail, sidewalk or other access point).	10
Collisions	1 point for each reducible* collision per kilometer in the past five years plus 5 points for each reducible collision per kilometer involving a vulnerable road user within the past five years.	10
Presence of Sidewalks	5 points if the road does not have a continuous sidewalk on at least one side.	5

*The collision data used for the criteria should be limited to those collision types which may have been prevented by traffic calming treatments. Excluding the collisions which may not have been prevented ensures that the project does not receive a higher priority for an outlying safety issue beyond the scope of traffic calming. High collision rate areas should be given broader consideration and reviewed outside of the Traffic Calming Policy. In addition to collisions with vulnerable road users, engineering judgement must be used to identify collisions which may be reduced based on suitable traffic calming measures.

Both mid-block and intersection collisions may be considered if they meet the above criteria. In order to ensure that longer streets don't receive a higher priority versus a shorter street because of the higher likely number of collisions due to length, a collision rate is utilized. The collision rate is expressed as the number of collisions per kilometre of roadway.

4.5. Stage 2 - Project Development

4.5.1. Administration will define a study area, including all local roads bound by the nearest collector/major roads. If the request is located on a Class II Collector, the study area should include the area adjacent to the collector bound by major roads. A decision tree is provided in **Table 2** and illustrations in **Figure 3** to assist with defining the study area. Some element of professional judgment will be required in finalizing the limits. If cut-through traffic is confirmed as an issue, the study area should consider potential alternative routes cut-through traffic would take if measures were implemented.

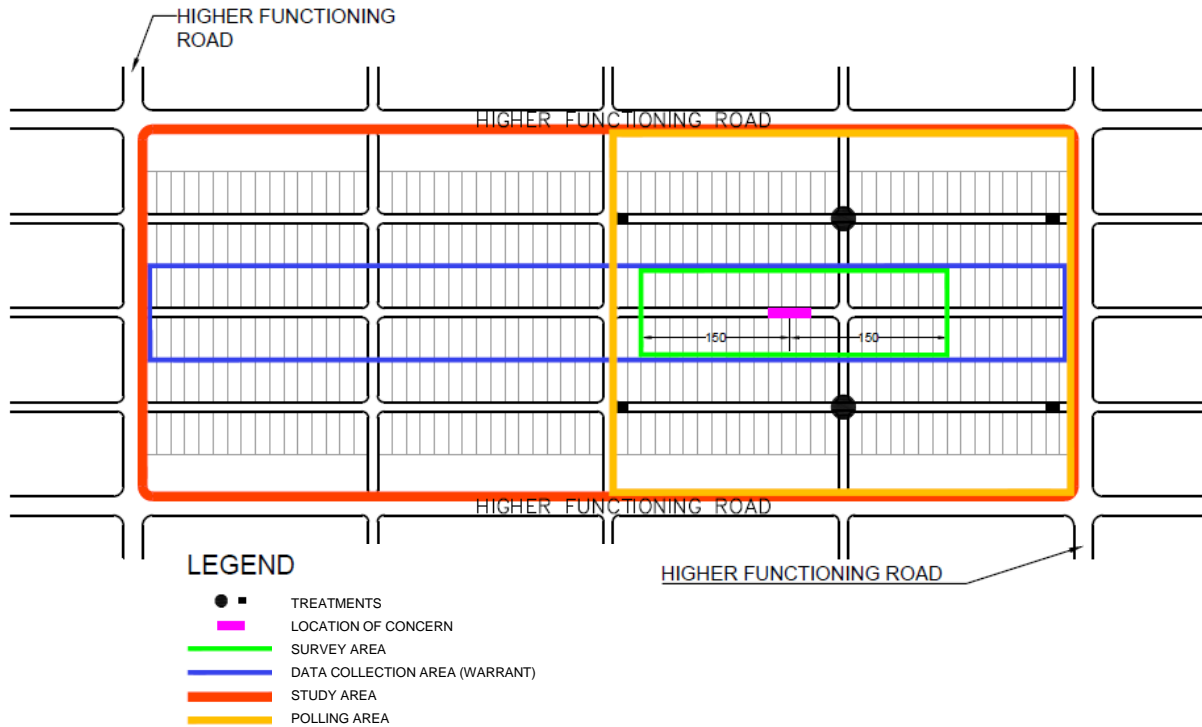
- Cut-through traffic may be confirmed by estimating the number of trips made by residential and other types of units along the road. If the measured traffic volume is greater than the estimated volume, cut-through traffic may be assumed.

4.5.2. The polling area is defined as all streets on which measures will be placed, extending from the last measure to the next nearest intersection. An illustrated is provided in **Figure 3**.

Table 2: Decision Tree for Defining the Study Area

Source of Issue	Location of Issue	Issue	Study Area Suggestion
Local Traffic	Block	Speed	Identified block (including turns on/off the block)
		Volume	Access management study required
		Both	Identified block (including turns on/off the block) and alternate routes
	Intersection	Speed	One block radius from intersection
		Volume	Access management study required
		Both	One block radius from intersection
	Multiple Blocks (Linear)	Speed	Identified blocks (including turns on/off the blocks)
		Volume	Neighborhood area
		Both	Identified blocks (including turns on/off the blocks) and alternate routes
	Neighbourhood Wide	Speed	Neighborhood area
		Volume	
		Both	Neighborhood area and alternate routes
Shortcutting (or both local and shortcutting)	Block	Speed	Identified block (including turns on/off the block) and alternate routes
		Volume	
		Both	
	Intersection	Speed	One block radius extending from identified intersection
		Volume	
		Both	
	Multiple Blocks (Linear)	Speed	Identified blocks (including turns on/off the blocks) and alternate routes
		Volume	
		Both	
	Neighbourhood Wide	Speed	Neighborhood area and alternate routes
		Volume	
		Both	
Other			Professional Judgement

Figure 3: Examples of Study and Polling Area



4.5.3. Administration will then develop a Traffic Calming Plan for the study area using the Traffic Calming Toolbox provided in **Attachment A**.

- **Table A-1** provides general recommendations for traffic calming measures according to road classification.
- **Table A-2** provides cost estimate ranges used for each measure.
- **Table A-3** provides a brief description of each measure.
- Administration will continue to explore new traffic calming measures and may test different measures as pilot projects to determine if they are suitable for temporary or permanent installation.
- Each location/scenario should be evaluated with the full range of traffic calming measures.
- Applicable policies, guidelines and master plans should be considered during the review, including the City's Active Transportation Master Plan (ATMP), School Neighbourhood Policy and the Transportation Association of Canada (TAC) Canadian Guide to Traffic Calming. Any traffic calming construction work shall meet the requirements on the City of Windsor Development Manual and any relevant City of Windsor Engineering Standard Drawings.

4.5.4. The proposed Traffic Calming Plan should include:

- Description of all aspects of the project;
- Description of the problem including results of data collection;

- Proposed design layout with signage; and
 - Description/photos of proposed treatment with cost estimate.
- 4.5.5. Notifications will be mailed to all dwelling units and commercial properties within the study area, inviting residents and stakeholders to attend an open house to review the proposed Traffic Calming Plan, ask questions and provide comments. Notices may also be advertised in the local newspaper, City website or media.
- 4.5.6. The community will be given the opportunity to provide feedback on the design during a given feedback period. A second public meeting may be required if the feedback results in substantial design changes.
- 4.5.7. Other affected agencies, such as the Windsor Accessibility Advisory Committee (WAAC), the Windsor Bicycling Committee (WBC), Bus Kids, any affected Business Improvement Areas (BIA) and the Windsor-Essex County Health Unit (WECHU), may be invited to provide comments and feedback.
- 4.5.8. Additional collection of speed and volume data may be required due to a change in study area boundaries based on feedback.

4.6. Stage 3 - Project Approval

- 4.6.1. Once the comments have been reviewed, the City will mail a letter to all dwelling units and commercial properties within the polling area to disclose the final details of the proposed Traffic Calming Plan and request participation in a telephone survey using the City's 311 system (or other means appropriate) to identify community acceptance. **A minimum 50% must respond, and of this, 60% must indicate their support for the Traffic Calming Plan.** If threshold is met, the Traffic Calming Plan will be deemed to have been approved by the community in the polling area. If this threshold is not met, the project ends.
- 4.6.2. Approved Traffic Calming Plans will be prioritized using the points score outlined above, with consideration to implementation cost. Projects will be put forward in priority sequence for approval to proceed with implementation. The number of projects put forward in any given year will depend on associated implementation cost and available budget. The length of time a project has been waiting for implementation funding will not influence whether it is constructed in the coming season. Practical considerations may affect the selection of projects, some of which include the availability of funds restricted to specific activities or areas, the potential to coordinate with other projects and the availability of alternate funding sources. Although a project may be appropriate for traffic calming, it may take several years before it proceeds to implementation. The City's traffic calming website provides details about traffic calming projects and status.
- 4.6.3. Administration will present a report to the Environment, Transportation and Public Safety Standing Committee containing the Traffic Calming Plan and the results of the prioritization process (including details of costs and public support) for consideration and recommendation to Council

about implementation and funding the Traffic Calming Plan. Additional methods for presenting the results of the process to the Council include an annual presentation as a part of the capital budgeting process. Other methods may be developed as necessary. Council makes the decisions about funding for the implementation of the traffic calming measures.

4.7. Stage 4 - Project Implementation

4.7.1. Outcome reviews will be undertaken 6-12 months following installation of traffic calming measures to evaluate effectiveness. The scope of outcome reviews will be dependent on the objectives of the project, and will generally include the collection of speed, volume, and collision data for comparison against pre-installation data.

- Due to the types of roads for which traffic calming will be considered, it is highly unlikely that any significant collision trends will be identified over an analysis period of 6-12 months. Additional time may be required before collision data may be used to help evaluate the results of the traffic calming treatment.
- The outcome review will in most cases not include a diverted traffic analysis. These may be considered if comparable data was collected prior to installation and this was a key objective for the installation.

4.7.2. Success with traffic calming will be a reduction in vehicle speed, volume, and/or collisions. Depending on the outcome achieved, Administration may choose to run the site through the warrant/prioritization process to see if it still has a need and how it compares to other potential sites. If Administration decides that the traffic calming measures have not been effective, they may recommend undertaking further public meetings to discuss amendments to the project. Prior to the convening of public meetings, a report will be delivered to Council reviewing the performance of said traffic calming measures.

4.7.3. Projects waiting for implementation may be referred to the Temporary Expedited Traffic Calming Procedure.

5. RECORDS, FORMS, AND ATTACHMENTS

5.1. Records for this policy shall be prepared and retained in accordance with Records Retention By-Law 21-2013, as amended.

5.2. Attachment A – Traffic Calming Toolbox

ATTACHMENT A – Traffic Calming Toolbox

Table A-1: Permanent Traffic Calming Measures by Road Classification

Item #	Category	Measure	Local	Class II Col.	Class I Col.	Est. Cost Range	Est. Annual Maint. Cost
1.1	Vertical Deflection	Speed Hump ¹	✓	x	x	\$ - \$\$	\$ - \$\$
1.2		Textured Crosswalk	✓	▲	▲	\$ - \$\$	\$
1.3		Raised Crosswalk	▲	x	x	\$\$ - \$\$\$\$	\$
1.4		Raised Intersection	✓	x	x	\$\$\$\$ - \$\$\$\$\$	\$
1.5		Speed Table ¹	✓	✓	✓	\$\$	\$
2.1	Horizontal Deflection	Curb Radius Reduction	✓	✓	✓	\$\$	N/A
2.2		Speed Kidneys	✓	▲	x	\$ - \$\$	\$ - \$\$
2.3		On-Street Parking	✓	✓	✓	\$ - \$\$	\$
2.4		Lane Narrowing (Physical)	✓	✓	✓	\$ - \$\$	N/A
2.5		Raised Median Island	✓	✓	✓	\$\$	\$
2.6		Sidewalk/Curb Extension	✓	✓	✓	\$\$	N/A
2.7		Traffic Circle or Roundabout	✓	✓	✓	\$\$ - \$\$\$\$\$	\$
2.8		Right-in/Right-out Island	✓	✓	✓	\$\$	\$
2.9		Chicanes	✓	x	x	\$\$	\$
2.10		Road Diet	✓	✓	✓	\$\$\$	N/A
3.1	Volume Control	Directional (Half) Closure	✓	x	x	\$ - \$\$\$	\$
3.2		Full Closure ²	✓	x	x	\$\$\$\$	\$
3.3		Diagonal Diverter	✓	x	x	\$\$\$	\$
3.4		Raised Median Through Intersection	✓	✓	✓	\$\$	\$ - \$\$

Table A-1: Permanent Traffic Calming Measures by Road Classification (cont.)

Item #	Category	Measure	Local	Class II Col.	Class I Col.	Est. Cost Range	Est. Annual Maint. Cost
4.1	Non-Physical	Radar Speed Feedback Signs	✓	✓	✓	\$\$	\$
4.2		Vehicle Activated Warning Signs	✓	✓	✓	\$ - \$\$	\$
4.3		Pavement Markings	✓	✓	✓	\$ - \$\$	\$ - \$\$
4.4		On-Road Sign Pavement Markings	✓	✓	x	\$ - \$\$	\$ - \$\$
4.5		Turn Prohibition (signed) ³	✓	✓	x	\$	\$
4.6		Through Traffic Prohibition (signed) ³	✓	✓	x	\$	\$
4.7		Traffic Calmed Neighborhood Sign ³	✓	✓	✓	\$	\$
Legend: ✓ Applicable ▲ Consider with Caution x Not Appropriate							

Note 1 – In general, it is recommended that large, bolt-in traffic calming measures such as speed cushions not be installed at the same location for more than two years. Beyond this point, the pavement damage can be severe enough that the anchors may not be able to keep the cushions secured to the pavement.






Note 2 – the City’s ATMP recommends the City strive to ensure that traffic calming does not encourage dead end streets to preserve connectivity for pedestrians.

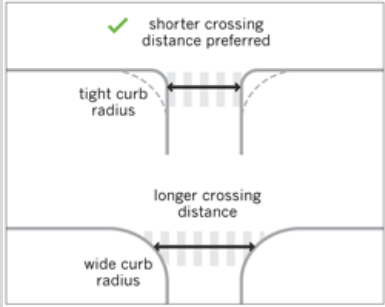
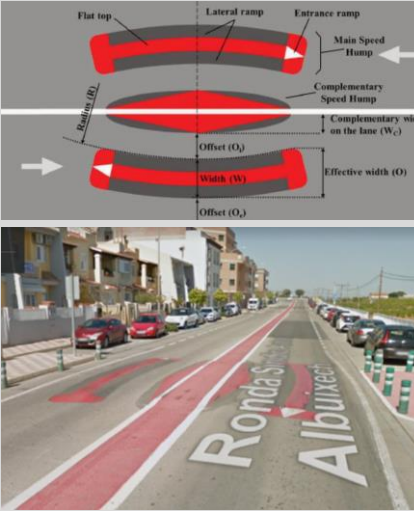


Note 3 – Only used in conjunction with physical measures.






Table A-2: Estimated Cost Range






Symbol	Range
\$	\$0 - \$5,000
\$\$	\$5,000 - \$20,000
\$\$\$	\$20,000 - \$50,000
\$\$\$\$	\$50,000 - \$100,000
\$\$\$\$\$	> \$100,000

Table A-3: Permanent Traffic Calming Measures





Item #	Measure	Example	Description
1.1	Speed Hump	 <p data-bbox="591 541 786 569">www.fhwa.dot.gov</p>	Speed humps provide a vertical, tactile alert to drivers, encouraging lower speeds.
1.2	Textured Crosswalk	 <p data-bbox="591 903 786 930">www.fhwa.dot.gov</p>	Brick pavers or other materials are used to help distinguish the pedestrian crosswalk from the roadway. This feature may also help to remind drivers to remain alert to the presence of pedestrians and other non-motorized traffic.
1.3	Raised Crosswalk	 <p data-bbox="591 1266 786 1293">www.fhwa.dot.gov</p>	Raised crosswalks serve as a visual and tactile alert to drivers of the presence of pedestrians and other non-motorized traffic.
1.4	Raised Intersection	 <p data-bbox="591 1545 786 1572">www.fhwa.dot.gov</p>	Raised intersections provide visual and tactile encouragement for drivers to lower their speed, particularly on their approach to the intersection where non-motorized traffic especially may be present.
1.5	Speed Table <small>Note 1</small>	 <p data-bbox="607 1812 769 1839">www.surrey.ca</p>	Speed tables serve a similar function as speed humps but allow for slightly higher speeds and are generally preferred by emergency services over speed humps.

<p>2.1</p>	<p>Curb Radius Reduction</p>	 <p>www.mto.gov.on.ca</p>	<p>Reductions in curb radii force drivers to manoeuvre turns at lower speeds, encouraging lower speeds on the approaches to the intersection.</p>
<p>2.2</p>	<p>Speed Kidneys</p>	 <p>google.com/maps (Rondo Sindic Antoni Albuixech, Almussafes, Spain)</p>	<p>A speed kidney is an arrangement of three elongated speed humps with a curvilinear shape, built into the pavement in the direction of travel. Vehicle drivers can slow down and deviate the raised sections, or travel over them similar to a speed hump.</p>
<p>2.3</p>	<p>On-Street Parking</p>	 <p>Vancouver.ca</p>	<p>On-street parking may help to lower speeds along streets by narrowing the travel ways and encouraging drivers to be more alert for vehicles or other drivers entering or exiting vehicles.</p>
<p>2.4</p>	<p>Lane Narrowing</p>	 <p>www.fhwa.dot.gov</p>	<p>Narrow lanes tend to encourage lower speeds as drivers feel slightly constricted. This may be achieved through physical alterations as well as the addition of on-street parking, bike lanes, pavement markings, movable planters or traffic calming curbs.</p>

2.5	Raised Median Island	 <p data-bbox="591 474 786 499">www.fhwa.dot.gov</p>	<p data-bbox="919 205 1430 457">Raised median islands may be used to provide a physical refuge area for pedestrians and other non-motorized traffic. They may also be used to help narrow travel ways. These features help to encourage lower driver speeds.</p>
2.6	Sidewalk/ Curb Extension	 <p data-bbox="532 835 854 861">Contextsensitivesolutions.org</p>	<p data-bbox="919 520 1430 772">Curb extensions reduce the distance pedestrians and other non-motorized traffic must travel when crossing the street. They may also be used to narrow travel ways, or reduce curb radii, slowing driver speeds.</p>
2.7	Traffic Circle or Roundabout	 <p data-bbox="537 1136 841 1192">google.com/maps (35th & Raleigh St., Denver, CO)</p>  <p data-bbox="574 1413 802 1465">google.com/maps (Sandwich St., Windsor)</p>	<p data-bbox="919 884 1430 1136">Traffic circles and roundabouts require drivers to slow their approach and yield to traffic while transitioning through the intersection. May be designed to be traversable for larger vehicles and emergency response vehicles.</p>
2.8	Right-in/Right-out Island	 <p data-bbox="599 1734 776 1759">www.fhwa.dot.gov</p>	<p data-bbox="919 1486 1430 1654">Right in/right out islands restrict vehicle flow to help eliminate left turn movements into and out of driveways lowering the potential for conflicts.</p>

2.9	Chicanes	 <p>en.wiktionary.org/wiki/chicane</p>	Bump-outs on opposite sides of the road require drivers to slow down to zigzag through the roadway configuration.
2.10	Road Diet	 <p>Roadsbridges.com</p>	Reconfiguration of a roadway to allocate reclaimed road width for other uses, such as turning lanes, bike lanes, pedestrian refuge islands or parking.
3.1	Directional (Half) Closure	 <p>www.stocktongov.com</p>	Partially restricts the flow of vehicles along the street. This measure is strictly for volume control and has little impact on driver speeds.
3.2	Full Closure	 <p>www.victoria.ca</p>	A full closure or cul-de-sac eliminates through traffic for motor vehicles at one end of a road, serving as a volume control measure.
3.3	Diagonal Diverter	 <p>www.sanantonio.gov</p> <p>google.com/maps (Monmouth Rd., Windsor)</p>	Diagonal diverters allow some traffic to flow through the intersection in restricted ways to discourage (not necessarily eliminate) through traffic.

<p>3.4</p>	<p>Raised Median Through Intersection</p>	 <p>www.pedbikesafe.org</p>	<p>Raised medians through an intersection prohibits cross traffic in one direction. This helps reduce or eliminate through traffic in one direction. Small gaps may be included to allow bicycle and other non-motorized traffic to pass through.</p>
<p>4.1</p>	<p>Radar Speed Feedback Sign</p>	 <p>www.townofsananselmo.org</p>	<p>Post or pole-mounted radar speed feedback signs provide immediate feedback alerting the driver to their speed. Ideally this will encourage drivers to obey the speed limit. Additional enforcement or physical measures are encouraged to reinforce the treatment.</p>
<p>4.2</p>	<p>Vehicle Activated Warning Sign</p>	 <p>unipartdorman.com</p>	<p>Solar powered electronic signs equipped with radar speed detectors alert drivers of hazards ahead when activated by speeds surpassing a programmed threshold.</p>
<p>4.3</p>	<p>Pavement Markings</p>	 <p>ctre.iastate.edu</p> <p>alertdriving.co.nz</p>	<p>Pavement markings, such as traverse bars or chevrons, may be used to provide drivers more notice about their speed. These are only appropriate in certain areas, such as rural locations or transition zones where drivers are being reminded of a change in roadway character.</p>

<p>4.4</p>	<p>On-Road Sign Pavement Markings</p>	 <p>google.com/maps (Queen St. S., Hamilton, Ontario)</p> <p>google.com/maps (S. Sterling Ave., Tampa, Florida)</p>	<p>Sign pavement markings may be used to provide on-road messages, such as “MAX 50 km/h”, “Stop Ahead”, “School Ahead”, or “SLOW”.</p>
<p>4.5</p>	<p>Turn Prohibition (signed)</p>	 <p>www.fhwa.dot.gov</p>	<p>Turn prohibitions should serve a similar purpose as directional closures or diagonal diverters.</p>
<p>4.6</p>	<p>Through Traffic Prohibition (signed)</p>	 <p>www.fhwa.dot.gov</p>	<p>Through traffic prohibitions should serve a similar purpose as full closures, diagonal diverters, or raised medians through intersections.</p>
<p>4.7</p>	<p>Traffic Calmed Neighbourhood Sign</p>	 <p>www.surrey.ca</p>	<p>Traffic Calmed Neighborhood signs help to alert drivers of the presence of traffic calming measures. Ideally this will provide additional encouragement for drivers to lower speeds and increase alertness to the presence of non-motorized traffic. Only used in conjunction with physical measures.</p>