

The Municipal Corporation of the Town of Fort Erie

By-law No. 74-2023

Being a By-law to Adopt a Neighbourhood Traffic Calming Policy and to Repeal By-law No. 1999-140

Whereas By-law No. 1999-140 was passed by the Municipal Council of the Town of Fort Erie on August 16, 1999 to adopt a Neighbourhood Traffic Management Policy; and

Whereas Report No. IS-19-2022 was considered and approved at the Council-in-Committee meeting held on July 11, 2022, to approve a Neighbourhood Traffic Calming Policy; and

Whereas Report No. IS-09-2023 was considered and approved at the Council-in-Committee meeting held on April 17, 2023, to receive the Neighbourhood Traffic Calming Policy Implementation for information purposes; and

Whereas it is deemed desirable to repeal By-law No. 1999-140 and adopt the Neighbourhood Traffic Calming Policy dated June 2022.

Now therefore the Municipal Council of The Corporation of the Town of Fort Erie enacts as follows:

1. **That** the Neighbourhood Traffic Calming Policy attached to and forming part of this by-law, as Schedule 'A', is adopted and approved.
2. **That** By-law No. 1999-140 is repealed.
3. **That** the Clerk of the Town is authorized to affect any minor modifications, corrections or omissions, solely of an administrative, numerical, grammatical, semantical or descriptive nature to this by-law or its schedules after the passage of this by-law.

Read a first, second and third time and finally passed this 24th day of April, 2023.

Mayor

Clerk

I, Carol Schofield, the Clerk, of The Corporation of the Town of Fort Erie certifies the foregoing to be a true copy of By-law No. 74-2023 of the said Town. Given under my hand and the seal of the said Corporation, this _____ day of _____, 20____



Neighbourhood Traffic Calming Policy

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1 Introduction

1.1 Policy Purpose and Objectives

The **Town of Fort Erie Neighbourhood Traffic Calming Policy** provides a transparent, fair, and standardized process for addressing resident concerns about vehicle speeds and/or traffic volumes on neighbourhood streets. The policy guides Town staff and the Traffic Coordinating Committee (TCC) in identifying and prioritizing eligible locations for traffic calming and in applying traffic calming measures on Town streets. The aim is to improve safety for all road users and reduce aggressive driving behaviour, with the goal of improving liveability and “quality of life” in local neighbourhoods.

The Neighbourhood Traffic Calming Policy is an important risk management tool for the Town of Fort Erie. Once in place, applying the policy consistently is of equal importance.

1.2 Traffic Calming Definition

The Transportation Association of Canada (TAC) *Canadian Guide to Traffic Calming* describes traffic calming as:

“The process and measures applied by road authorities to address concerns about the behaviour of motor vehicle drivers travelling on streets within their jurisdictions.”¹

Traffic calming measures are usually applied in locations experiencing excessive vehicle speed and/or high volumes of shortcutting traffic with the goal of enhancing community livability and road safety, particularly for vulnerable users like seniors, children, and cyclists. The application of these measures is intended to restore neighbourhood streets to their desired function of providing mobility and access in appropriate combinations depending on the specific location, role, and classification of the roadway.

Traffic calming measures are broadly categorized into the following two groups:

- ▶ **Physical Measures** consist primarily of vertical and horizontal deflections in the roadway. This group also includes treatments that narrow the roadway, alter the road surface, or restrict access. Physical measures are intended to influence motorist perceptions, thereby altering driver behaviour, and forcing

¹ TAC. *Canadian Guide to Traffic Calming*. February 2018. p.1.

motorists to travel at lower speeds and/or to select alternative routes.

- ▶ **Non-Physical Measures** include tools and strategies intended to influence or modify driver behaviour, often described as education and enforcement.

The Traffic Calming Toolkit in **Appendix A** provides further information on the traffic calming measures applicable for use on Fort Erie neighbourhood streets.

When applied properly, traffic calming can help “reduce the negative effects of motor vehicle use, alter driver behaviour, and improve conditions for non-motorized street users”² by:

- ▶ Reducing motor vehicle speeds;
- ▶ Reducing traffic volumes;
- ▶ Lessening short-cutting (traffic infiltration);
- ▶ Reducing pedestrian crossing distances and times;
- ▶ Reducing the risk and severity of motor vehicle collisions; and
- ▶ Reducing conflicts between roadway users.

Most traffic calming measures are "self-enforcing" in nature, which reduces the need for police enforcement to ensure compliance.

Neighbourhoods can benefit from the installation of traffic calming measures in other ways. For example, road narrowing allows for opportunities to increase landscaping and visually improve the aesthetics of the neighbourhood and reduce storm water runoff quantities.

While traffic calming offers several potential benefits, physical measures can be costly and time-consuming to design, install, and maintain if used inappropriately. The installation of traffic calming can also cause unintended consequences, like:

- ▶ Increased emergency vehicle response and transit operating times;
- ▶ Reduced or impeded access and egress from neighbourhoods by vehicle;
- ▶ Shifting or diverting of traffic volumes and/or speeding concerns onto other roadways;

² Institute of Transportation Engineers. Subcommittee on Traffic Calming. 1997.

- ▶ Increased maintenance costs, including snow clearing and curbside waste collection; and
- ▶ Increased vehicle emissions and/or noise pollution.

Careful consideration and proper planning, design, and implementation are key to a successful traffic calming scheme.

1.3 Policy Scope

The Town of Fort Erie Neighbourhood Traffic Calming Policy:

- ▶ Identifies the types of Town roads to which the policy applies;
- ▶ Provides a flow chart to illustrate policy application and identifies the steps to be completed in responding to a request for traffic calming measures; and
- ▶ Outlines public participation and public input requirements.

The policy features a:

- ▶ Neighbourhood driven process for receiving, evaluating, and responding to citizen requests for traffic calming, including a typical community engagement protocol;
- ▶ Methodology and evaluation criteria to determine if traffic calming is appropriate for a given street and prioritize locations being considered for measures;
- ▶ List of proven traffic calming measures (the “toolkit”); and
- ▶ Procedure for monitoring and assessing the effectiveness of traffic calming measures after installation.

The policy incorporates best practices in traffic calming with local context to provide an appropriate, efficient, and flexible framework for addressing traffic-related inquiries received by the Town. It supplements guidance contained in the TAC *Canadian Guide to Traffic Calming* and *Geometric Design Guide for Canadian Roads* with considerations specific to Fort Erie. The policy also reflects applicable Provincial legislation including the *Accessibility for Ontarians with Disabilities Act* (AODA) and the *Highway Traffic Act* (HTA). The planning, design, and implementation of Neighbourhood Traffic Calming Plans in Fort Erie must comply with relevant provisions of these and other statutes.

1.4 Guiding Principles

The following guiding principles form the basis for the Town of Fort Erie Neighbourhood Traffic Calming Policy:

- ▶ Make public safety the primary consideration in traffic management and roadway design, as allowed by the Town's financial and engineering resources.
- ▶ Ensure the process is fair, balanced, and equitable and reflects the needs of all users.
- ▶ Consider enforcement capabilities of Niagara Regional Police and possibilities or methods to improve enforcement in assessing the implementation of traffic calming measures.
- ▶ Apply appropriate signage and wayfinding methodology in developing Neighbourhood Traffic Calming Plans.
- ▶ Implement traffic control devices, including all-way stop control, based on recognized warrants and criteria.
- ▶ Recognize that traffic operations, safety, and environmental issues concern residents and must be addressed to enhance the quality of life and livability in a manner in keeping with Town resources, policies, and by-laws.
- ▶ Support efforts to reduce the use of the automobile as the primary mode of transportation and encourage safe and practical measures to emphasize the use of non-auto modes of travel within local neighbourhoods.
- ▶ Maintain and promote a hierarchical roadway network, which will result in a balanced, affordable, and efficient transportation system. The Town of Fort Erie Official Plan classifies most roadways under the Town's jurisdiction as Local Roads or Collector Roads. According to Section 12.7.1 (Road Classifications) of the plan:
 - Local Roads are designed to carry relatively low volumes of traffic travelling at low speeds from abutting properties to Collector Roads, Arterial Roads or Provincial Highways. Such roadways should not provide for through traffic.
 - Collector Roads are designed to carry moderate volumes of inter-neighbourhood and inter-district traffic and to function as links between Arterial Roads or Provincial Highways and Local Roads.
- ▶ Reflect the requirements of pedestrians, particularly seniors, children, and neighbourhood residents, and other pedestrian

activities that take place within the road allowance in roadway design, where feasible.

- ▶ Maintain adequate emergency access to, and circulation within, residential communities.
- ▶ Encourage effective public consultation and input in all aspects of the Neighbourhood Traffic Calming Study process.
- ▶ Undertake Neighbourhood Traffic Calming Plans following a prioritization process consistent with applicable by-laws and within available funding capabilities.
- ▶ In cooperation with Niagara Regional Police, encourage and facilitate community participation in neighbourhood traffic management through the promotion of community-based (and community-run) education programs.
- ▶ Facilitate the implementation of traffic calming measures in new subdivisions where applicable at draft plan circulation stage.
- ▶ Consider operational and maintenance requirements of the subject roadway, particularly winter control activities, drainage, and parking, in developing Neighbourhood Traffic Calming Plans.
- ▶ Have regard for the Town's Active Transportation Master Plan and Complete Streets typologies when developing a Traffic Calming Plan.

2 Policy Application

The Director of Infrastructure Services, or designate, on behalf of the Town of Fort Erie will apply the Neighbourhood Traffic Calming Policy through Neighbourhood Traffic Calming Studies or Plans carried out by the Infrastructure Services Department in conjunction with the TCC and with assistance from other Town departments, external agencies, and consultants, if required. Neighbourhood residents and interested groups will also participate in the study process.

2.1 Traffic Calming Measures

The Town will typically apply non-physical traffic calming measures before considering physical measures.

If non-physical measures prove ineffective or inappropriate under the circumstances, the Town will consider the installation of physical traffic calming measures on Local Roads and Collector Roads in residential neighbourhoods within the four urban areas designated on Schedule A of the Town of Fort Erie Official Plan:

- ▶ When there is a demonstrated safety, excessive speed, and/or shortcutting traffic concern and acceptable alternative measures have been exhausted or are not appropriate; and
- ▶ After exploring methods to improve operation of the arterial road network, such as signal timing optimization.

The Town may also consider implementing traffic calming:

- ▶ In new developments as part of the development approval process; and
- ▶ On-road reconstruction projects where safety, excessive speed, and/or shortcutting traffic concerns are anticipated to occur upon (re)opening the road to traffic.

The Town will not install traffic calming measures on streets in new subdivision plans until they have been assumed by the municipality.

Where the installation of physical traffic calming measures is deemed the preferred course of action, the Town will:

- ▶ Determine whether an area-wide plan or street-specific scheme is more suitable. An area-wide plan will be pursued if a street-specific scheme would likely result in the displacement of traffic onto adjacent streets.

- ▶ Take into consideration the needs of non-motorized modes of transportation through the introduction of traffic calming. Measures will typically be designed to enhance or minimize impacts to pedestrian and cyclist movement.

Traffic calming measures may not be appropriate in every situation and, if considered, should ensure the equitable and consistent treatment of all Town street users following the guidance in this document.

2.2 Trial Installations

The Town will typically implement the recommended Neighbourhood Traffic Calming Plan on a trial basis for a period of up to 24 months, at the discretion of the Director, using temporary/seasonal measures prior to installing the permanent solution. Undertaking a trial installation enables the Town to:

- ▶ Further understand the plan potential and its desirability before investing in a permanent installation, thereby allowing for refinement of the final design;
- ▶ Avoid or defer the initial capital cost of more expensive permanent installations;
- ▶ Gauge community reaction on a concept in real application prior to permanent installation; and
- ▶ Retain flexibility to remove traffic calming measures seasonally.

Products typically used for temporary/seasonal traffic calming include:

- ▶ Removable rubber products (e.g., curbing, speed humps, tables, cushions);
- ▶ Removable/flexible posts and bollards;
- ▶ Pavement markings; and
- ▶ Temporary speed display boards.

After evaluating the trial application and surveying neighbourhood residents, if needed, the Town will decide whether to install the approved Traffic Calming Plan permanently.

In certain circumstances, the Town may decide to move forward with permanent installation without a trial application after taking into consideration the possible negative aspects of using temporary/seasonal measures, which can include:

- ▶ Lower relative aesthetic value;

- ▶ On-going operational costs and/or additional operational resource requirements;
- ▶ Requirements for seasonal installation and removal;
- ▶ Potential to have similar or higher overall costs than permanent installations;
- ▶ Potentially lower effectiveness than permanent materials; and
- ▶ Quicker degradation of roadway surfaces (specifically where measures are anchored into existing road surfaces).

2.3 Removal of Traffic Calming Measures

Permanent traffic calming measures may be removed at the request of neighbourhood residents. A petition signed by at least 51% of residents directly fronting on the subject street(s) is required to initiate the process.

The approved Neighbourhood Traffic Calming Plan must remain installed for at least three years before removal can be requested. If the permanent measures are removed, the subject street(s) must wait at least another three years before submitting a new request for traffic calming. This provision does not apply to non-physical traffic calming measures.

If the Town receives a request to remove one traffic calming measure within an approved Neighbourhood Traffic Calming Plan, all measures may be considered for removal. While it may be possible in certain circumstances to remove only one traffic calming measure, in most cases, the entire plan is needed to be effective.

The Town reserves the right to remove traffic calming measures deemed to be ineffective or to pose a safety risk, or if the treatments have created unintended consequences that cannot be rectified. This may include the unintended diversion of traffic onto an adjacent Local Road and/or Collector Road (rather than onto the Arterial Road network). The Town will notify affected residents if considering the removal of traffic calming measures.

3 Public and Stakeholder Participation

3.1 Community Involvement and Consultation

The Neighbourhood Traffic Calming Policy provides a coordinated, comprehensive approach to implementing traffic calming. An integral element of the policy is the community input and consensus building designed to ensure public acceptance of a neighbourhood traffic calming initiative.

Community involvement is an integral part of the Neighbourhood Traffic Calming Study process – from problem identification, to plan development, to monitoring the installation. Active and robust consultation helps foster support (and reduce opposition) for potential traffic calming measures and ultimately aids in ensuring a positive outcome with the neighbourhood and Town Council.

A single method of community involvement is not suitable for all situations. The Town may employ a variety of techniques to engage the public, such as workshops, online presentations, community meetings, and mailouts.

More complex and contentious issues typically require greater levels of public education and consultation. Throughout the process, the following principles should be applied in involving the community in Neighbourhood Traffic Calming Studies:

- ▶ Involve residents and businesses early and frequently in the process, within available staff resources.
- ▶ Identify areas of agreement as early as possible in the process and concentrate resources on areas of contention.
- ▶ Clearly define what is (and is not) within the project scope.
- ▶ Present relevant technical information and data to allow informed input.
- ▶ Provide convenient and accessible methods for interested parties to participate and offer feedback.
- ▶ Explain how public feedback influences the decision-making process, including why specific suggestions are (or are not) included.

Adherence to these basic public consultation principles will ensure that studies are undertaken in a manner that is consistent with the needs and aspirations of all parties.

The successful creation and implementation of any Neighbourhood Traffic Calming Plan will depend on the level of communication and understanding between the Town and the local community, and within the neighbourhood itself. The Town aims to build consensus through the process.

There may be instances when traffic calming measures are warranted, but neighbourhood residents have conflicting opinions on the preferred approach to addressing the identified concerns. In these circumstances, the Town may need to conduct additional community engagement and further outreach with the potentially impacted residents to resolve the situation.

The Town will communicate with the local community throughout the Neighbourhood Traffic Calming Study process, primarily through the **Let's Talk Fort Erie** engagement site [<https://letstalk.forterie.ca/>]. The site will serve as a “one-stop portal” for all study-related information and online engagement efforts. The Town may also include these communications on their social media feeds and in local newspapers, as deemed appropriate. Distribution methods will depend on the size and nature of the study area.

Appendix B provides typical community involvement and communication tools used by the Town for Neighbourhood Traffic Calming Studies.

3.2 Role of Town Departments, External Agencies and Interested Groups

The Infrastructure Services Department leads the Neighbourhood Traffic Calming Study process. Several other Town departments and external agencies may become involved in the process, including the following:

Town of Fort Erie:

- ▶ Infrastructure Services – Engineering Division
- ▶ Infrastructure Services – Operations Division
- ▶ Planning and Development Services
- ▶ Fire Services
- ▶ By-law Enforcement

External Agencies:

- ▶ Niagara Regional Police
- ▶ Fort Erie Transit and Niagara Regional Transit
- ▶ Niagara Emergency Medical Services (EMS)

Depending on the nature and location of the affected neighbourhood and the selected traffic calming measures, the following agencies and/or groups may also become involved:

External Agencies:

- ▶ Ministry of Transportation, Ontario
- ▶ Niagara Region
- ▶ Niagara Parks Commission
- ▶ District School Board of Niagara and Niagara Catholic District School Board

Interested Groups:

- ▶ Waste Collection Contractors
- ▶ Seniors Groups
- ▶ School Bus Operators
- ▶ Taxi Associations

Town staff will serve as facilitators and resource persons for Neighbourhood Traffic Calming Studies, keeping participants informed as studies progress.

4 Implementation Process

4.1 Neighbourhood Traffic Calming Plan

The Town of Fort Erie Neighbourhood Traffic Calming Policy can be described as a “set of instructions” or guidelines for responding to community traffic concerns. An effective implementation process ensures the needs of the community, and the Town, are carefully considered in the Neighbourhood Traffic Calming Study. The implementation process is intended to make best use of existing resources and address all identified traffic concerns consistently.

The Neighbourhood Traffic Calming Study process involves eight steps. The following sections describe each step in greater detail. Refer to **Figure 4.1** for the sequence of activities.

4.1.1 Step 1 – Study Initiation

Residents with traffic-related concerns initiate the Neighbourhood Traffic Calming Study process by submitting a request to the Town’s Infrastructure Services Department using the form contained in **Appendix C**. Ward Councillors can also request a study on behalf of their constituents.

4.1.2 Step 2 – Initial Screening

Town staff will conduct an initial screening of the request to determine if the subject street(s) is a candidate for physical traffic calming measures.

Requests on streets that do not meet the criteria set out in **Table 4.1** will be denied. Town staff will inform the originator that the subject street(s) does not qualify for physical traffic calming but may be a candidate for non-physical measures, such as education and enforcement, subject to funding and resource availability.

4.1.3 Step 3 – Technical Assessment

Town staff will assess the technical merit of requests passing the initial screening for the implementation of physical traffic calming measures and present the findings to the TCC. The assessment process involves assigning a point score to the seven traffic and land use criteria outlined in **Table 4.2**. The maximum score based on this methodology is 100 points.

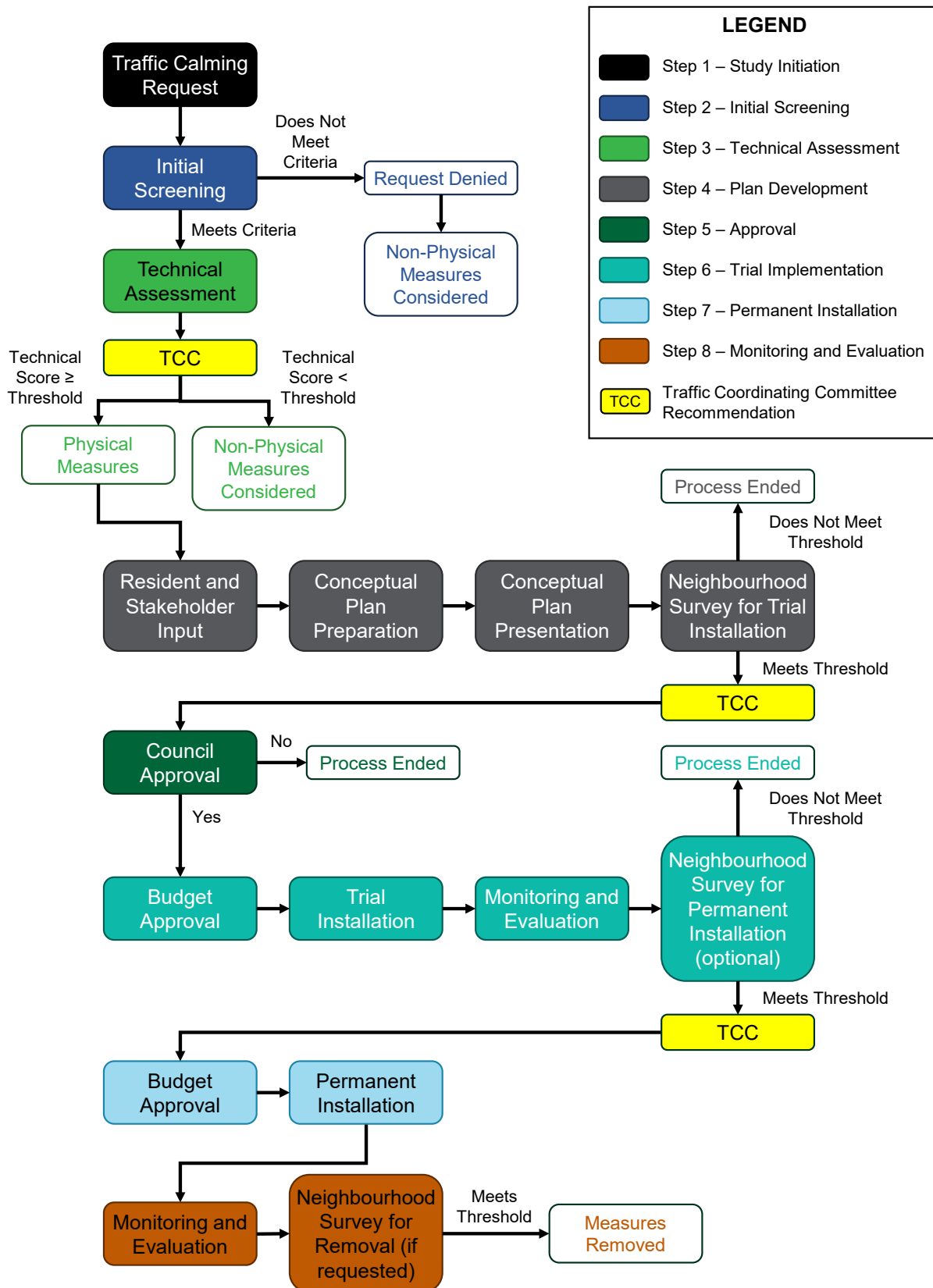


FIGURE 4.1: NEIGHBOURHOOD TRAFFIC CALMING STUDY PROCESS

TABLE 4.1: SCREENING CRITERIA

Criteria	Threshold	Traffic calming may be considered if:	Satisfied
Previously Requested or Permanent Installation Removed	Within Last Three Years	A prior request has not been received or permanent traffic calming measures have not been removed from the subject street(s) in the last three years.	
Roadway Classification	Local Road or Collector Road	The subject street(s) is designated a Local Road or Collector Road in the Town of Fort Erie Official Plan.	
Land Use Designation	Within an Urban Area	The subject street(s) is located within one of the four Urban Areas designated on Schedule A of the Town of Fort Erie Official Plan.	
Location	Not on a Truck Route or Primary Emergency Vehicle Route (Ambulance, Fire, Police)	The subject street(s) does not serve as a truck route and/or primary emergency vehicle route (ambulance, fire, police services) unless exempted by the Town.	
Speed Limit	≤ 50 km/h	The posted speed limit on the subject street(s) is 50 km/h or less.	
Grade	$< 8\%$	The average grade of the subject street(s) is less than 8%.	
Segment Length	≥ 150 metres	The average distance between stop-controlled intersections along the subject street(s) is 150 metres or more.	
Are All Criteria Met?			Yes/No

TABLE 4.2: TECHNICAL ASSESSMENT AND PRIORITIZATION CRITERIA

Criteria	Point Assignment	Maximum Points (100)	Score
Pedestrian/ Cycling Activity	5 points for each adjacent pedestrian and/or cycling generator within the study area (i.e., school, park, playground, recreation centre, senior's home, library, shopping centre, place of worship, etc.)	20	
Pedestrian/ Cycling Facilities	5 points if: <ul style="list-style-type: none"> ▶ No sidewalks on either side of the subject street(s) for Local Road or ▶ Sidewalk on only one side of the subject street(s) for Collector Road plus 5 points for designated cycling facilities on the subject street(s)	10	
Residential Frontage	5 points for primarily residential frontage on subject street(s)	5	
Cut-Through Traffic ¹	5 points if: <ul style="list-style-type: none"> ▶ 25% for Local Road or ▶ 40% for Collector Road plus 5 points for each 10% increment thereafter	15	
Total Traffic Volume ²	1 point for every: <ul style="list-style-type: none"> ▶ 100 vehicles per day for Local Road or ▶ 250 vehicles per day for Collector Road 	15	
Speed ³	1 point for every: <ul style="list-style-type: none"> ▶ 1 km/h over the posted speed limit and ▶ 1% of vehicles observed 10 km/h or more over the posted speed limit 	30	
Collision History ⁴	1 point for each qualifying collision over the last three years	5	
Total Score (Minimum for Local Road/Collector Road)		40/60	

Notes:

1. See Section 4.2 to estimate the percentage of cut-through (non-local) traffic.
2. Traffic volumes used in the evaluation are two-way average daily volumes over a 24-hour period.
3. The 85th percentile speed is calculated from data collected using automated traffic recorders (or similar units) over a 24-hour period.
4. Includes all collisions along the subject street(s) except for collisions occurring at intersections with arterial roads and collisions involving animals.

Candidate locations scoring more than 40 points for Local Roads or 60 points for Collector Roads will be recommended to proceed to plan development (Step 4), subject to any unique or local considerations. Non-physical traffic calming measures, such as education and enforcement, will be recommended for locations not meeting these criteria, if appropriate.

For locations satisfying the minimum threshold, Town staff will also recommend a study area to the TCC. Key considerations when defining the study area include:

- ▶ Subject street (segment(s) of concern);
- ▶ Traffic data;
- ▶ Location and context of sensitive land uses near, or adjacent to, streets of interest;
- ▶ Other Town policies (e.g., Official Plan, Active Transportation Master Plan);
- ▶ Opportunities and limitations such as available resources and partnerships; and
- ▶ Environmental factors (e.g., geographic features, major streets, key intersections).

For Local Roads, the study area will typically comprise properties with direct frontage on the subject street. For Collector Roads, the study area will include all properties with direct frontage on the subject street and the Local Roads connecting to the subject street, recognizing Collector Roads generally serve the broader neighbourhood. The study area may be expanded to capture potentially impacted households on other streets, especially if shortcutting traffic is the primary concern and traffic diversion is a possible outcome.

The TCC will consider the Town staff recommendation and provide direction on whether to proceed to plan development (Step 4). The TCC will prepare a response to the originator explaining the decision.

4.1.4 Step 4 – Plan Development

If requested by the TCC, Town staff will develop a Neighbourhood Traffic Calming Plan to address identified traffic concerns. The toolkit of measures contained in **Appendix A** and relevant guideline documents, including the *TAC Canadian Guide to Traffic Calming*, will be referenced in identifying and designing traffic calming treatments for the plan. Data collected during prior steps, in addition to site visits, historical information, future maintenance and construction plans, and participant feedback, will be considered in developing the plan.

To begin, Town staff will consult with residents and stakeholders (Town departments and external agencies) to confirm neighbourhood traffic issues, identify candidate traffic calming measures, and note potential implementation challenges. The Town will then prepare a conceptual Neighbourhood Traffic Calming Plan (or options, if appropriate) based on the input received and forward the concept(s) to stakeholders for comment. Community meetings would also be held to present the concept plan(s) to neighbourhood residents and obtain their feedback.

After incorporating input received from the public and stakeholders, Town staff will poll neighbourhood residents to gauge support for the proposed Neighbourhood Traffic Calming Plan, with implementation initially on a trial basis. The survey will also identify the preferred plan alternative if more than one option exists.

Proposed plans not receiving broad-based neighbourhood support (defined as a minimum of 60% support from at least 25% of all eligible households within the study area³) may need to be modified or re-examined. If the Town considers the plan worthy of consideration despite lack of resident support, it may choose to proceed based on a clear need to address specific traffic safety issues or at the direction of Town Council.

4.1.5 Step 5 – Approval

Town staff will present the recommended Neighbourhood Traffic Calming Plan, its priority ranking, potential funding sources, and the neighbourhood survey findings to the TCC for recommendation and to Town Council for approval. Prioritization will be based on the point score calculated through the technical assessment (Step 3). Changes to the recommended plan (e.g., cost, design, funding source) may be suggested by the TCC or Council.

If the plan is not approved, the Town will not entertain new requests for a Neighbourhood Traffic Calming Study on the subject street(s) for a period of at least three years.

4.1.6 Step 6 – Trial Implementation

Each year as part of Capital Budget preparation, Town staff will propose traffic calming installation locations for the coming year, if any. Locations will be selected based on the priority ranking.

³ If multiple options are presented to the public, the minimum response rate must still be met. The option with the majority of respondents in agreement will be carried forward.

Upon budget approval, Town staff will implement the recommended Neighbourhood Traffic Calming Plan for a period of up to 24 months, at the discretion of the Director, using temporary/seasonal materials per **Section 2.2**. Town staff will notify study area households of the intention to install the traffic calming measures on a trial basis prior to implementation.

The Town will monitor the effectiveness of the installation and make minor refinements, if needed, during the trial period. The modifications should not alter the intent or key features of the recommended Neighbourhood Traffic Calming Plan unless a significant operational and/or safety concern arises following implementation.

As the trial period closes, Town staff will evaluate the success of the trial installation and identify potential refinements if the Neighbourhood Traffic Calming Plan is being considered for permanent installation. The scope of the evaluation should be consistent with the investigations conducted prior to installation to allow “before/after” or “cause/effect” comparisons. Potential studies may include speed surveys (to assess change in vehicle speeds), traffic counts (to determine changes in volumes) and/or origin-destination surveys (to estimate the volume of traffic diverting to adjacent streets). The evaluation should also consider winter operating conditions.

The Neighbourhood Traffic Calming Plan should not cause the transference of traffic from the subject street(s) to adjacent Local Roads and/or Collector Roads. If evaluation studies indicate traffic volumes have increased 15% or more (with a minimum of 150 vehicles per day) on an adjacent street(s) due to the traffic calming measures, the Town will consider corrective action to remedy the situation or reconsider permanent installation.

The Town may poll neighbourhood residents to gauge support before making the Neighbourhood Traffic Calming Plan permanent, subject to any plan refinements identified through monitoring and evaluation. The same thresholds for defining broad-based neighbourhood support from the trial implementation apply (i.e., minimum of 60% support from at least 25% of all eligible households within the study area⁴). The Town may also consult directly with the public and/or stakeholders in determining whether to install the plan permanently, including publishing the findings of the monitoring and evaluation program.

⁴ If multiple options are presented to the public, the minimum response rate must still be met. The option with the majority of respondents in agreement will be carried forward.

Upon review of all technical and public/stakeholder input, the TCC will decide whether to recommend the permanent retention, removal, or alteration of the Neighbourhood Traffic Calming Plan to Town Council.

4.1.7 Step 7 – Permanent Installation

If approved, the Town will install the final Neighbourhood Traffic Calming Plan (with any alterations) with permanent materials, subject to available resources and other priorities. Further budget approval may be required to finance the installation cost. The Town may also need to prepare detailed design and tender documents to facilitate construction. Town staff will notify study area households of the intention to install the traffic calming measures permanently prior to implementation.

4.1.8 Step 8 – Monitoring and Evaluation

Following implementation, Town staff will continue to monitor the subject street(s) (and entire study area in some cases) and evaluate the effectiveness of the Neighbourhood Traffic Calming Plan and its impact on the surrounding road network in a similar manner to the trial.

Permanent traffic calming measures may be removed at the request of the neighbourhood if a majority of residents directly fronting the subject street(s) support their removal. The Town may also remove traffic calming measures that it deems ineffective, pose a safety risk, or cause unintended consequences. **Section 2.3** describes the process for removal.

4.2 Estimating Cut-Through Traffic

The Town will estimate the percentage of cut-through (non-local) traffic on the subject street(s) in applying **Table 4.2** using one of the following methods, listed in order from least to most complex/resource intensive/accurate. Select the technique providing the necessary level of precision for the least effort, with Method #1 or #2 typically used earlier in the study process (Step 2 – Initial Screening and Step 3 – Technical Assessment and Prioritization) and Method #3 in the later stages (Step 6 – Trial Implementation and Step 7 – Permanent Installation):

Method #1 – Simplified Trip Generation Calculation

Approximate the percentage of cut-through traffic in predominately residential areas using the following formula:

$$\text{Percentage Cut – through Traffic} = \frac{ADT - (10 \times \text{Dwellings})}{ADT}$$

where,

ADT = Recorded Average Daily Traffic volume (vehicles per day)

Dwellings = Number of houses on the subject street

Each dwelling on the subject street is assumed to generate 10 vehicle trips per day, roughly the weekday trip generation rate for a single-family detached dwelling cited in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition). The percentage cut-through traffic on the subject street should be measured between main intersections or entry points into the study area.

Method #2 – Study Area Trip Generation Calculation

Determine the daily or peak hour trip generation potential of the study area based on its land uses and ITE *Trip Generation Manual* rates. Compare the projected volume of trips to the recorded ADT or peak hour traffic counts to calculate the percentage of cut-through traffic. Similar in approach to Method #1, this method can be used for study areas that feature a mix of land uses, like residential, commercial, schools and parks, for example.

Method #3 – Origin-Destination Study

Record vehicle license plates at all entry and exit points to the study area manually or using digital technology. Match the license plates of vehicles entering and exiting to determine the percentage of vehicles passing through the study area compared to those that begin or end their trip within the zone.

4.3 Other Implementation Options

Traffic calming measures can also be implemented in the Town of Fort Erie through land development and road reconstruction projects. In both cases, measures will still be selected from the Traffic Calming Toolkit provided in **Appendix A**. The resulting traffic calming measures will also be monitored and evaluated after implementation following the procedure described in **Section 4.1**.

4.3.1 New Development

The Town may require the implementation of traffic calming measures on new streets in new developments through the development approval process, potentially as a condition of approval for Plan of Subdivision and Site Plan Control applications. Given new development can change travel demand, proponents may be requested to investigate the potential need for changes to the street network (including consideration of traffic calming measures) as part of the Transportation Impact Assessment completed in support of the

proposed development. Specific requirements may include identifying traffic calming opportunities on existing roads (i.e., to mitigate anticipated negative impacts of introducing the new development) and identifying, planning, and constructing traffic calming measures on new roads (e.g., road network internal to new subdivisions or future planned roads).

4.3.2 Road Reconstruction Projects

The Town may implement traffic calming measures, when suitable, as part of planned road, water, and/or sewer reconstruction projects. Traffic calming recommendations will be based on the existing operational characteristics, constraints, and context of the subject street, and consultations with the community as required.

The key advantages of this approach are the potential for cost savings and reduced impact of construction on communities through packaging of projects into fewer construction activities (e.g., minimizing throwaway, such as replacing construction before the end of its lifecycle). This approach also provides an opportunity to potentially achieve lower prices for traffic calming features through economies of scale.

5 Traffic Calming Measures

5.1 Traffic Calming Toolkit

The TAC *Canadian Guide to Traffic Calming* identifies a broad range of traffic calming techniques. From this catalogue of options, the Town has established a shortlist of potential traffic calming measures for use on streets in Fort Erie.

Appendix A provides the “toolkit” of traffic calming measures with a description and photo of each treatment. The list summarized in **Table A.1** captures a range of different approaches to traffic calming and reflects input received from key Town stakeholders. The Traffic Calming Toolkit notes whether the measures are applicable on Local Roads and/or Collector Roads and summarizes potential traffic calming benefits and other implementation considerations. The toolkit also includes a process for selecting the most appropriate traffic calming treatments from the list of potential measures. Indicative costs and design guidance are provided as well.

Applying the toolkit consistently will assist the Town in selecting appropriate measures to address specific neighbourhood traffic issues and help to avoid the undesirable consequences of traffic calming. It is important to note that not all traffic calming measures are appropriate under all circumstances. Selection of suitable measures will depend on the specific issues being addressed and careful consideration of site-specific conditions.

5.2 Selection and Design

The selection and design of traffic calming measure(s) is the culmination of a series of sequential activities. As noted in **Appendix A**, the most appropriate measure(s) will depend directly on the type and magnitude of the traffic issue to be addressed.

The major planning considerations – location and frequency of the devices, geometric design, and material – will vary considerably by location. Specific factors may include:

- ▶ Roadway designation (Local Road, Collector Road);
- ▶ Roadway cross-section (rural, urban);
- ▶ Roadway geometric features (right-of-way, pavement widths, radii, parking, etc.);
- ▶ Presence of transit;
- ▶ Implications of diverting traffic to adjacent streets;

- ▶ Cost (capital and operating);
- ▶ Presence of pedestrian facilities;
- ▶ Presence of cycling facilities; and
- ▶ Complete Street typology.

6 Use of Regulatory Signs for Traffic Calming

The Town will not consider the use of the following regulatory signs for the sole purpose of traffic calming:

6.1 All-Way Stop Control

The Town is often requested to install an all-way stop to discourage excessive speeding and/or traffic infiltration on neighbourhood streets. While this may be appropriate in select instances, all-way stop control is generally not intended for this purpose, as noted in the TAC *Canadian Guide to Traffic Calming*.

The installation of unwarranted stop signs is not recommended due to the documented negative impacts of such signs that include:

- ▶ Increased traffic noise due to slowing down for and accelerating away from stop signs;
- ▶ Increased vehicle emissions, fuel consumption, and vehicle wear due to unnecessary stopping at and accelerating away from stop signs;
- ▶ Greater speeding between intersections
- ▶ Disregard for stop signs if not accompanied by continuous police enforcement;
- ▶ Reduced compliance with all-way stop control in general;
- ▶ Motorists, in their haste, tend to be more attentive for other vehicles at intersections and do not perceive pedestrians or cyclists;
- ▶ Because of motorist behaviour noted above, pedestrians have a false sense of security.

Even when justified, all-way stops can increase the risk of certain collision types, most notably rear-end crashes.

The Town applies warrants to determine where all-way stop control is merited. These warrants, which consider vehicle and pedestrian volumes, traffic distribution (percent of vehicles on the major street versus the minor street), and collision history, follow provincially recommended guidelines set out in Ontario Traffic Manual (OTM) Book 5 (Regulatory Signs).⁵ The guidebook indicates the purpose of a stop

⁵ Ministry of Transportation, Ontario. *Ontario Traffic Manual Book 5: Regulatory Signs*. December 2021.

sign is to assign right-of-way between vehicles approaching an intersection from different directions when traffic signals are not warranted or not yet installed. The document also explicitly states all-way stop control should not be used:

- ▶ Where the protection of pedestrians, particularly school children, is a prime concern. This concern can usually be addressed by other means;
- ▶ As a speed control device; and/or
- ▶ As a means of deterring the movement of through traffic in a residential area.

6.2 Speed Reduction and Movement Restriction Signs

Regulatory signs intended to reduce vehicle speeds (i.e., speed limits, Community Safety Zones) or restrict movement (i.e., turn prohibitions, one-way) often require enforcement to ensure driver compliance and effectiveness. For this reason, the TAC *Canadian Guide to Traffic Calming* recommends using these signs only to supplement and reinforce desired driver behaviour and not as traffic calming measures on their own.

Appendix A

Traffic Calming Toolkit (provided separately)

Appendix B

Public Engagement Tools

How does the Town Assess a Traffic or Road Safety Concern?

The Town reviews and evaluates traffic concerns to identify the most appropriate solutions for local streets.

Step 1: Study Initiation

Traffic calming request received from resident or Ward Councillor

Step 2: Initial Screening

Street must meet specific criteria to be considered for physical traffic calming measures

Step 3: Technical Assessment

Streets satisfying the minimum threshold recommended to proceed to plan development

Step 4: Plan Development

Traffic calming plan developed with input from neighbourhood and stakeholders using toolkit of measures

Step 5: Approval

Town Council approves plan

Step 6: Trial Implementation

Recommended plan implemented for 12 to 18-month trial period and evaluated

Step 7: Permanent Installation

Effective plans with community support installed with permanent materials

Step 8: Monitoring and Evaluation

The Town will continue monitor and evaluate the plan and may remove the measures if requested by nearby residents



Who Can I Contact to Find Out More?

Contact: Name/department
website/ email and phone number



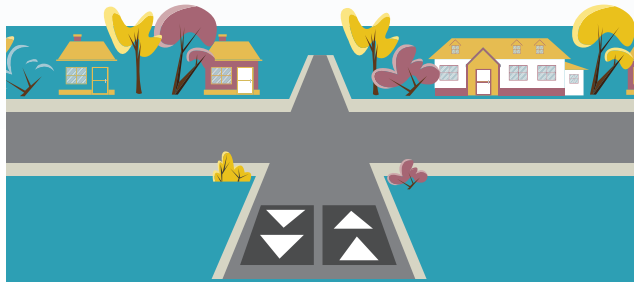
Neighbourhood Traffic Calming Policies

Safe streets are important
to our Fort Erie community



What is Neighbourhood Traffic Calming?

Safe streets are important to the Fort Erie community. The Town's Neighbourhood Traffic Calming Policy helps make streets safer by providing a process to address community requests and tools to slow and calm traffic on neighbourhood streets.



Vertical Deflection

Speed Cushions are raised road areas, similar to a speed hump but do not cover the full width of the road. They limit vehicle speeds while allowing buses and emergency vehicles to pass with minimal impact.



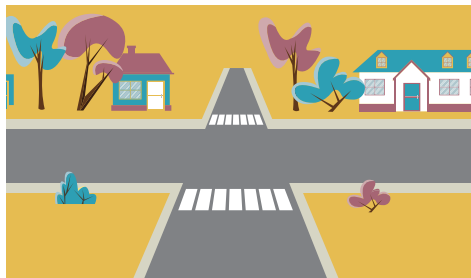
Horizontal Deflection

Curb Radius Reductions (Tighter Corners) reconstruct an intersection corner with a smaller turning radius to slow down right-turning vehicles, reduce pedestrians' crossing distances, and improve visibility.



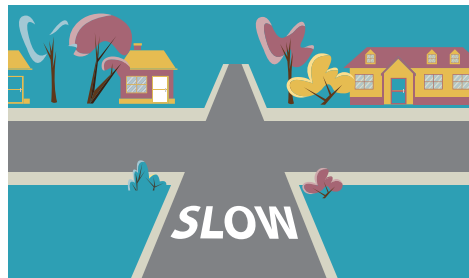
Roadway Narrowing

Curb Extensions (Bump Out) narrow lanes to reduce vehicle speeds and crossing distance for pedestrians, increase visibility, and prevent parking close to an intersection. Bump outs can also work on urban arterial roads.



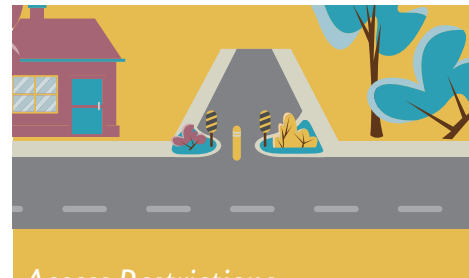
Surface Treatments

Sidewalk Extensions are sidewalks that continue across an intersection. They have textures or patterns to enhance drivers' awareness of the pedestrian crossing.



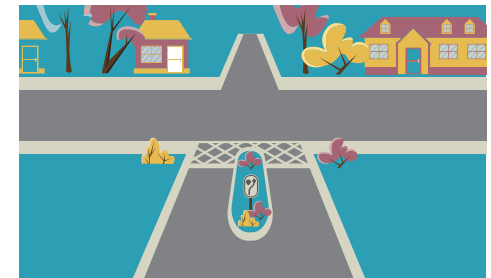
Pavement Markings

Pavement Markings (i.e., lines, symbols, words) can be placed on all road types to provide information to drivers (e.g., yellow centre line, "SLOW DOWN", "Stop Ahead").



Access Restrictions

Diverter are raised barriers that can help re-direct and reduce cut-through traffic. The barrier can include gaps for pedestrians, wheelchairs and bicycles and can be mountable by emergency vehicles.



Gateways

Gateways combine multiple traffic calming approaches at the entry to an area. They help transition between different areas like commercial, rural, or residential zones.

How Can Traffic Be Calmed? The Basics

The Town's policy features seven categories of **physical traffic calming measures** to change the character and/or design of a roadway to better manage traffic. In some instances, the Town may use **non-physical measures** such as education and enforcement to supplement and/or as an alternative to physical measures or as a first step in responding to neighbourhood concerns.

ALL-WAY STOPS IN FORT ERIE

All-way stops are just one of many tools to help manage traffic flow in a neighbourhood.

What is an All-Way Stop?

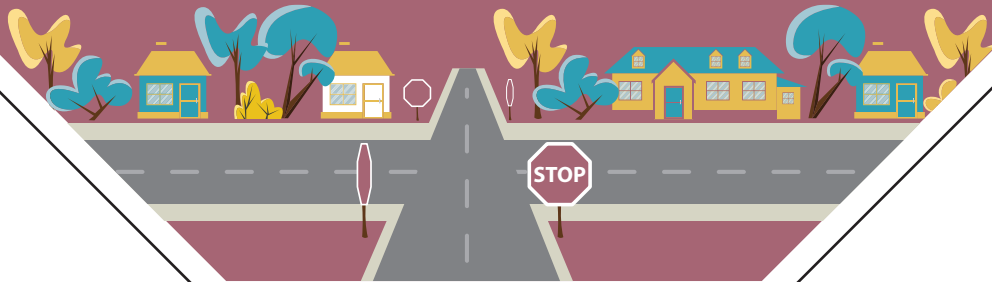
STOP signs assign right-of-way between vehicles approaching an intersection from different directions. Drivers coming up to a STOP sign must stop their vehicles before entering the intersection, yield to any traffic in or approaching the intersection, and then proceed when it is safe.

In some locations, the town may install STOP signs on all approaches to an intersection to stop vehicles in all directions before entering

the intersection. All-way (or multi-way) stops are designed for local roads with slower vehicle speeds and work best at intersections of roadways with similar characteristics and traffic volumes. They can help reduce right and left-turn collisions, especially at intersections with low visibility, but can delay motorists and increase the frequency of rear-end crashes. So they should not be used indiscriminately.

How Does the Town Decide to Install an All-Way Stop?

The Town will consider the installation of an all-way stop where a traffic engineering study indicates this form of control is the best solution for the intersecting roadways. Based on guidelines set out in the Ontario Traffic Manual, the study will consider factors such as traffic volumes and speeds, sight lines, road user behaviour, and collision experience.





ALL-WAY STOPS

When are All-Way Stops Not the Best Choice?

While all-way stops provide clear right-of-way for drivers, they are not always the best solution to speeding, cut-through traffic, or pedestrian and cyclist safety problems in a neighbourhood. In fact, the Ontario Traffic Manual indicates that all-way stops are not intended to control speeding or address pedestrian safety. Research by the Institute of Transportation Engineers, the Transportation Association of Canada, and municipalities across Canada has shown all-way stops have limited affect on vehicle speeds and can only improve safety in select instances.

What Other Options Exist to Keep Roads Safe?

Check out the Town's Neighbourhood Traffic Calming Policy, which provides over 35 potential traffic calming tools to help address common driving concerns in neighbourhoods.

How do I Request an All-Way Stop?

1. Submit a request to the Infrastructure Services Department at [NAME/EMAIL/WEB FORM](#)
2. Infrastructure Services staff will review the request and, if the Town has not investigated a similar request in the past year, conduct the traffic engineering study.
3. Infrastructure Services staff will contact the individual to inform of the study outcome. If the study indicates this form of control is the best solution, staff will prepare a report to Town Council and if approved, the stop sign will be installed.



Appendix C

Neighbourhood Traffic Calming Study Application Form

Neighbourhood Traffic Calming Study Application Form

What location are you requesting a Neighbourhood Traffic Calming Study for?

Which of the following applies to you?

- | | |
|---|---|
| <input type="checkbox"/> I live on this street. | <input type="checkbox"/> I work on this street. |
| <input type="checkbox"/> My kids go to school on this street. | <input type="checkbox"/> I live nearby and use this street frequently for commuting, cycling, or walking. |
| <input type="checkbox"/> Other (please specify): | |
-

Please select the primary areas of concern for the street in question:

- | | |
|--|--|
| <input type="checkbox"/> Speeding | <input type="checkbox"/> Cut-through traffic |
| <input type="checkbox"/> Vehicle volumes | <input type="checkbox"/> Collisions |
| <input type="checkbox"/> Pedestrian and cyclist safety | <input type="checkbox"/> Other (please specify): |
-

Is there a specific time of day when traffic is an issue?

- | | |
|------------------------------------|----------------------------------|
| <input type="checkbox"/> Morning | <input type="checkbox"/> Noon |
| <input type="checkbox"/> Afternoon | <input type="checkbox"/> Evening |
| <input type="checkbox"/> Overnight | <input type="checkbox"/> All day |

Name: _____ Date: _____

Email: _____ Phone: _____

Preferred method of contact: ☐ Email ☐ Phone

Thank you for your Neighbourhood Traffic Calming Study request. You will receive a confirmation email or phone call once your application has been processed.



Traffic Calming Toolkit

DRAFT June 2022

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Appendix A	Traffic Calming Toolkit
Appendix B	Traffic Calming Toolkit Decision Matrix

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1 Introduction

The **Town of Fort Erie Neighbourhood Traffic Calming Policy** provides a transparent, fair, and standardized process for addressing resident concerns about vehicle speeds and/or traffic volumes on neighbourhood streets. The policy guides Town staff and the Traffic Coordinating Committee (TCC) in identifying and prioritizing eligible locations for traffic calming and in applying traffic calming measures on Town streets. The aim is to improve safety for all road users and reduce aggressive driving behaviour, with the goal of improving liveability and “quality of life” in local neighbourhoods.

This **Traffic Calming Toolkit**, developed as part of the 2022 update to the policy, provides a comprehensive “toolkit” of traffic calming strategies, measures, and designs. The toolkit reflects the latest best practices in traffic calming, considering local context and available municipal resources for the Town of Fort Erie.

The remainder of the Toolkit document is organized as follows:

- ▶ **Chapter 2** summarizes the **basis for the toolkit**, providing pertinent information about the Transportation Association of Canada (TAC) *Canadian Guide to Traffic Calming*¹ (the Guide), the foundational publication that serves as the source of most guidance for this document;
- ▶ **Chapter 3** lists the **toolkit of traffic calming measures** for use in the Town of Fort Erie, with a description and photo of each treatment plus indicative costs and design guidance for implementation; and
- ▶ **Chapter 4** describes the six-step process for **selecting measures** from the toolkit.

Appendix A provides detailed information about each traffic calming treatment identified in **Chapter 3** to aid the Town in the identification and assessment of potential measures.

Appendix B contains a detailed comparison of the measures and their applicability based on cross-section (urban/rural), location (intersection/midblock), speed limit, average daily traffic volume, and roadway grade.

¹ Transportation Association of Canada. *Canadian Guide to Traffic Calming*. February 2018.

2 Basis for the Toolkit

2.1 Overview of the *Canadian Guide to Traffic Calming*

The TAC *Canadian Guide to Traffic Calming* is the preeminent source of information and guidance about traffic calming in Canada. Originally published in 1998, the Guide was updated in 2018 to incorporate the latest and best practices that evolved in the field over the 20 years since its release.

The Guide is a complete tool, providing direction on the application of traffic calming for both reactive operational retrofits and proactive approaches for new/reconstructed roadways. Most information presented in the Guide was sourced from communities in Canada and generally reflects the current state of practice in the country. Measures and designs drawn from international experience are included where needed to supplement or complete the guidance.

Much of the Guide is devoted to describing and providing information about the applicability, effectiveness, and design of potential traffic calming measures. This guidance served as the basis for the list of potential traffic calming techniques for use in the Town of Fort Erie set out below and the detailed profiles of the toolkit of measures contained in **Appendix A**. The Guide also provided information pertaining to the assessment and selection of specific traffic calming measures, including the material presented in **Appendix B**.

2.2 List of Potential Traffic Calming Measures

The Guide identifies a broad range of potential traffic calming techniques for use in Canada, organizing the measures into the following 11 general categories:

- ▶ Vertical Deflection
- ▶ Horizontal Deflection
- ▶ Roadway Narrowing
- ▶ Surface Treatments
- ▶ Pavement Markings
- ▶ Access Restrictions
- ▶ Gateways
- ▶ Enforcement
- ▶ Education
- ▶ Shared Space
- ▶ Emerging Technology

These measures can be broadly categorized into two groups, being:

- ▶ **Physical Measures**, which consist primarily of vertical and horizontal deflections in the roadway. This group also includes

treatments that narrow the roadway, alter the road surface, or restrict access. Physical measures are intended to influence motorist perceptions, thereby altering driver behaviour, and forcing motorists to travel at lower speeds and/or to select alternative routes.; and

- ▶ **Non-Physical Measures**, which include tools and strategies intended to influence or modify driver behaviour, often described as education and enforcement.

From the overall catalogue of options presented in the Guide, the Town has established a shortlist of potential traffic calming measures appropriate for the Town of Fort Erie. **Chapter 3** summarizes the “toolkit” of applicable techniques.

3 Toolkit of Traffic Calming Measures

3.1 Overview of the Toolkit

Appendix A details the “toolkit” of potential traffic calming measures for use on roads in the Town of Fort Erie. The toolkit includes a description and photo of each treatment and an overview of typical applicability, potential benefits, and other implementation considerations.

The list of applicable measures captures a range of approaches to traffic calming and reflects input received from Town stakeholders. **Table 3.1** provides a simplified, visual comparison of the different measures, highlighting their potential applicability, indicative costs, and design guidance (see **Sections 3.2 and 3.3**, respectively, for further information on these last two items).

The toolkit combines the latest and best practices in traffic calming with consideration of local context. Building on guidance contained in the Guide, the toolkit outlines a range of techniques that can be used to address different types of problems (i.e., speed, collisions, pedestrian conflicts, shortcutting traffic, etc.) in various contexts (i.e., on different road classifications, urban versus rural roadside environments, etc.). Information provided includes the pros and cons of each measure and its effectiveness based on background research.

The data contained in the toolkit assists the Town in selecting appropriate measures to address specific neighbourhood traffic concerns. This helps to avoid undesirable disbenefits of inappropriate measures for a particular application. **Chapter 4** provides further guidance on selecting specific measures for a traffic calming plan using this information.

TABLE 3.1: POTENTIAL TRAFFIC CALMING MEASURES

Measure		Applicability			Indicative Cost ¹			Design Details ²
		Local or Collector	Urban Arterial	Rural Arterial	Low	High	Trial	
1. Vertical Deflection								
1.1	Raised Crosswalk	●	✗	✗	\$5,000	\$20,000	\$10,000	4.2.1
1.2	Raised Intersection	●	✗	✗	\$30,000	\$150,000	n/a	4.2.2
1.3	Speed Cushion	●	✗	✗	\$6,000	\$10,000	\$8,500	4.2.3
1.4	Speed Hump	●	✗	✗	\$4,000	\$10,000	\$6,000	4.2.4
	Speed Table	●	✗	✗	\$5,000	\$20,000	\$10,000	
2. Horizontal Deflection								
2.1	Chicane (One-Lane, Two-Lane) ³	●	✗	✗	\$16,000	\$62,500	\$25,000	4.3.1
2.2	Curb Radius Reduction ⁴	●	▲	✗	\$60,000	\$125,000	\$10,000	4.3.2
2.3	Lateral Shift	●	▲	✗	\$16,000	\$62,500	\$25,000	n/a
2.4	Speed Kidney	●	✗	✗	n/a	n/a	n/a	4.3.3
2.5	Traffic Button/ Traffic Circle/Mini-Roundabout	●	✗	✗	\$3,000	\$50,000	\$10,000	4.3.4
		●	✗	▲	\$20,000	\$125,000	\$15,000	
3. Roadway Narrowing								
3.1	Curb Extension	●	●	✗	\$3,000	\$50,000	\$10,000	4.4.1
3.2	Lane Narrowing	●	▲	✗	\$12,000	\$20,000	n/a	OTM 11
3.3	On-Street Parking	●	▲	✗	\$12,000	\$20,000	n/a	4.4.2
3.4	Raised Median Island	●	▲	●	\$3,000	\$125,000	\$8,000	4.4.3
3.5	Road Diet ⁶	●	●	✗	n/a	n/a	n/a	4.4.4
3.6	Vertical Centreline Treatment	●	✗	●	\$2,500 (per km)	\$4,000 (per km)	n/a	OTM 6
4. Surface Treatment								
4.1	Sidewalk Extension/ Textured Crosswalk	●	▲	✗	\$12,000	\$30,000	n/a	4.5.1
4.2	Textured Pavement	●	✗	✗	\$75 (per m ²)	\$190 (per m ²)	n/a	n/a
4.3	Transverse Rumble Strips	▲	✗	●	\$3,000	\$4,000	n/a	n/a
5. Pavement Markings								
5.1	Converging Chevrons	●	▲	●	\$10,000	\$20,000	n/a	n/a
5.2	Dragon's Teeth	●	▲	●	n/a	\$4,000	n/a	n/a
5.3	Full-lane Transverse Bars	●	▲	●	n/a	\$4,000	n/a	n/a

TABLE 3.1: POTENTIAL TRAFFIC CALMING MEASURES

Measure		Applicability			Indicative Cost ¹			Design Details ²
		Local or Collector	Urban Arterial	Rural Arterial	Low	High	Trial	
5.4	On-Road 'Sign' Pavement Markings	●	●	●	\$150 (per symbol)	\$200 (per symbol)	n/a	OTM 11
5.5	Peripheral Transverse Bars	●	▲	●	n/a	\$4,000	n/a	4.6.1
6. Access Restriction								
6.1	Directional Closure	● ³	×	×	\$6,000	\$100,000	\$5,000	4.7.1
6.2	Diverter ¹	●	×	×	\$12,000	\$125,000	\$5,000	4.7.2
6.3	Full Closure	●	×	×	\$20,000	\$250,000	\$5,000	4.7.3
6.4	Intersection Channelization	●	▲	×	\$3,000	\$50,000	\$5,000	4.7.4
6.5	Raised Median Through Intersection	●	▲	×	\$3,000	\$50,000	\$5,000	4.7.5
6.6	Right-in/Right-out Island	●	▲	×	\$3,000	\$50,000	\$5,000	4.7.6
7. Gateways								
7.1	Gateways ⁵	●	●	●	\$10,000	\$50,000	\$5,000	n/a
8. Shared Space								
8.1	Shared Space ⁶	● ³	▲	×	n/a	n/a	n/a	n/a
9. Enforcement and Education								
9.1	Speed Display Devices	●	●	●	\$4,000	\$7,500	n/a	n/a
9.2	Targeted Speed Enforcement	●	●	●	n/a	n/a	n/a	n/a
9.3	Targeted Education Campaign	●	●	●	n/a	n/a	n/a	n/a
9.4	Vehicle Activated Signs	●	●	●	\$2,000	\$12,000	n/a	n/a

Legend:

● Applicable ▲ Use with Care × Not Appropriate

Notes:

1. See **Section 3.2** for explanation of indicative costs and sources.
2. See **Section 3.3** for explanation of design details and sources.
3. Measure typically not implemented on Collector roads
4. Assumes all corners of the intersection.
5. To be used in conjunction with other traffic calming measures. Typically consider for new development.
6. Measure is site-specific. Implemented as part of road reconstruction or new development.

3.2 Indicative Costs

Table 3.1 provides indicative costs, where available, for trial (temporary) and permanent installations of the traffic calming measures identified. The range of costs for permanent placement cited in Column 4 (Indicative Cost, Low) and Column 5 (Indicative Cost, High) were sourced primarily from the Institute of Transportation Engineers (ITE) *Traffic Calming Fact Sheets*² and adjusted to reflect Canadian dollars and inflation (from 2017 to 2021 dollars). Other municipal traffic calming guidelines³ were also referenced in deriving the permanent indicative costs. Costs are not provided for uncommon (e.g., speed kidney), site-specific (e.g., shared space), and primarily operational (e.g., targeted speed enforcement and targeted education campaign) measures, as denoted by “n/a”.

For trial installations, the indicative costs noted in Column 6 of **Table 3.1** (Indicative Cost, Trial) were estimated based on recent quotes from vendors/manufacturers. The prices were factored up to account for installation and removal following the trial. Costs are not provided in cases where trial installations are unlikely (e.g., raised intersection, any measure primarily signing or pavement marking), as denoted by “n/a”.

The indicative costs cited in **Table 3.1** provide order of magnitude estimates for planning purposes, but should be applied with caution given the many factors affecting actual implementation costs, such as:

- ▶ Width of roadway(s);
- ▶ Corner radii;
- ▶ Existing infrastructure and utilities (e.g., catch basins, maintenance holes, utility poles, streetlights);
- ▶ Dimensions of proposed feature(s) (e.g., island size, length of extensions, width/height of raised feature);
- ▶ Quantity (e.g., number of signs, length of pavement markings, numbers of signals);
- ▶ Property acquisition (if required);
- ▶ Landscaping;

² Institute of Transportation Engineers. *Traffic Calming Fact Sheets*. <https://www.ite.org/technical-resources/traffic-calming/traffic-calming-measures>. Accessed July 29, 2021.

³ City of Toronto. *Traffic Calming Guide for Toronto*. 2016. https://www.toronto.ca/wp-content/uploads/2017/11/97d0-2016-Traffic-Calming-Guide_March2017.pdf. Accessed July 29, 2021.

- ▶ Labour and materials;
- ▶ Design and contingency.

Closer to implementation, the Town will typically estimate permanent and trial installation costs based on more detailed design plans and current unit/benchmark prices derived from recent contracts.

3.3 Design Guidelines

The Town will generally follow the recommended design guidance provided in Chapter 4 of the Guide when implementing the traffic calming measures identified in **Table 3.1**. Column 7 (Design Details) denotes the relevant section to consult in the guidebook. The TAC *Geometric Design Guide for Canadian Roads*⁴ may also be referenced in the design process.

In a few instances, the table refers to the Ontario Traffic Manual (OTM) for guidance pertaining to signing or pavement marking treatments. References are not provided for measures without available guidance (e.g., lateral shift) or for non-physical measures (e.g., targeted speed enforcement), as denoted by “n/a”.

⁴ Transportation Association of Canada. *Geometric Design Guide for Canadian Roads*. June 2017.

4 Selecting Measures

Applying the toolkit consistently will assist the Town in selecting the most appropriate measures to address specific neighbourhood traffic issues and help avoid the potentially undesirable consequences of traffic calming. It is important to note that not all traffic calming measures are appropriate under all circumstances. The selection of suitable measures will depend on the exact issues being addressed and careful consideration of site-specific conditions.

The following outlines the typical decision process for selecting measures from the Traffic Calming Toolkit. As noted above, other factors can also influence the type of measures selected. See **Appendix B** for a detailed comparison of the measures and their applicability based on cross-section (urban/rural), location (intersection/midblock), speed limit, average daily traffic volume, and roadway grade.

Step 1

Determine if the subject street is a candidate for physical traffic calming measures. Per the Neighbourhood Traffic Calming Policy, locations meeting the initial screening criteria would be candidates for physical treatments. Streets not satisfying these criteria may be considered for non-physical traffic calming measures, such as education and enforcement, as a first step to address resident concerns.

Step 2

Identify the list of potentially applicable traffic calming measures based on roadway classification.

Step 3

Confirm and rank (based on severity) the primary issue(s) to be addressed through the traffic calming plan. Potential issues include:

- ▶ Speeding;
- ▶ Shortcutting traffic
- ▶ Pedestrian crossings
- ▶ Vehicle and pedestrian/cyclist conflicts;
- ▶ Heavy vehicles

Step 4

Shortlist the measures that address the issue(s) from the initial list assembled in Step 2.

Step 5

Focus on/eliminate measures that would/would not be appropriate under the following conditions:

- ▶ School Zones and Community Safety Zones
- ▶ Active transportation (cycling) routes
- ▶ Adjacent to park
- ▶ High pedestrian generators, particularly more vulnerable users
- ▶ Adjacent land uses (residential versus non-residential)
- ▶ Planned reconstruction
- ▶ Noise to surrounding neighbourhood
- ▶ Applicability for temporary installation

Step 6

Confirm measures can be used under current roadway conditions. Factors to consider include:

- ▶ Existing intersections and control
- ▶ Midblock pedestrian/cyclist crossings and control
- ▶ Cross-section width
- ▶ Need for on-street parking
- ▶ Roadway alignment (i.e., horizontal and vertical curvature)
- ▶ Grade
- ▶ Block Length
- ▶ Driveway density
- ▶ Pavement condition and materials
- ▶ Drainage
- ▶ Utilities and street furniture (e.g., benches, poles, boxes)
- ▶ Streetlighting

Appendix A

Traffic Calming Toolkit



1. VERTICAL DEFLECTION

1.1 Raised Crosswalk

Description and Purpose

A raised crosswalk is a marked pedestrian crosswalk at an intersection or midblock location constructed at a higher elevation than the adjacent roadway.

The purpose of a raised crosswalk is to reduce vehicle speeds, improve pedestrian visibility, and reduce pedestrian–vehicle conflicts.



Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban, sidewalk on at least one side of road
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Grade** – $\geq 1\%$, but $\leq 8\%$
- ▶ **Town** – Implement to facilitate pedestrian connections

Cost – \$ to \$\$

Timeline – Permanent

Engineering Study Required – Yes

Potential Traffic Calming Benefits

- Speed Reduction
- Volume Reduction
- Conflict Reduction
- Natural Environment



Implementation Considerations

- Local Vehicle Access
- Emergency Vehicle Response
- Cycling Use
- Traffic Enforcement
- Vehicle Parking
- Street Maintenance



No Benefit/Impact



Minor Benefit/Impact



Substantial Benefit/Impact

1. VERTICAL DEFLECTION

1.2 Raised Intersection

Description and Purpose

A raised intersection is an intersection, that may include crosswalks, constructed at a higher elevation than the adjacent approach roadways.

The purpose of a raised intersection is to reduce vehicle speeds, better define crosswalk areas, and reduce pedestrian-vehicle conflicts.

Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Grade** – $\geq 1\%$, but $\leq 8\%$
- ▶ **Town** – Site specific, considered as part of road reconstruction projects or new developments

Cost – \$\$ to \$\$\$

Timeline – Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

- Speed Reduction ☒
- Volume Reduction ☐
- Conflict Reduction ☒
- Natural Environment ☒

Implementation Considerations

- Local Vehicle Access ☐
- Emergency Vehicle Response ☒
- Cycling Use ☒
- Traffic Enforcement ☐
- Vehicle Parking ☐
- Street Maintenance ☒

- ☐/ ☐ No Benefit/Impact
- ☒/ ☒ Minor Benefit/Impact
- ☒/ ☒ Substantial Benefit/Impact

1. VERTICAL DEFLECTION

1.3 Speed Cushion

Description and Purpose

A raised area on a road, like a speed hump, but does not cover the entire width of the road. The width is designed to allow a large vehicle, such as a fire truck or bus, to “straddle” the cushion, while light vehicles will have at least one side of the vehicle deflected upward.

Speed cushions are intended to produce sufficient discomfort to limit passenger vehicle travel speeds yet allow the driver to maintain vehicle control, while allowing larger vehicles to pass without difficulty.



Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Primarily urban
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Grade** – < 8%
- ▶ **Town** – Primary measure

Cost – \$

Timeline – Temporary or Permanent

Engineering Study Required – Yes

Potential Traffic Calming Benefits

Speed Reduction	■
Volume Reduction	□
Conflict Reduction	■
Natural Environment	□

Implementation Considerations

Local Vehicle Access	□
Emergency Vehicle Response	■
Cycling Use	■
Traffic Enforcement	□
Vehicle Parking	■
Street Maintenance	■

□/□	No Benefit/Impact
■/■	Minor Benefit/Impact
■/■	Substantial Benefit/Impact

1. VERTICAL DEFLECTION

1.4 Speed Hump/Table

Description and Purpose

A speed hump is a raised area of a roadway, which causes the vertical upward movement of a traversing vehicle. The purpose of a speed hump is to cause discomfort for drivers travelling at higher speeds and to reduce vehicle speeds.

A speed table is an elongated raised speed hump with a flat-topped section that is long enough to raise the entire wheelbase of a vehicle. They may be constructed with brick or other textured materials on the flat section.

Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Grade** – < 8%
- ▶ **Town** – Implement where a speed cushion is not effective

Cost – \$-\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	■
Volume Reduction	□
Conflict Reduction	■
Natural Environment	□

Implementation Considerations

Local Vehicle Access	□
Emergency Vehicle Response	■
Cycling Use	□
Traffic Enforcement	□
Vehicle Parking	□
Street Maintenance	□

□/□	No Benefit/Impact
■/□	Minor Benefit/Impact
■/■	Substantial Benefit/Impact

2. HORIZONTAL DEFLECTION

2.1 Chicane

Description and Purpose

A chicane is a series of curb extensions on alternating sides of a roadway, which narrow the roadway and require drivers to steer from one side of the roadway to the other to travel through the chicane. Multiple series of curb extensions can be used.

The purpose of this measure is to discourage shortcutting or through traffic and reduce overall speeds by forcing the lateral shifting of vehicles travelling through the chicane.



Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – ≥ 750 vpd
- ▶ **Grade** – $< 8\%$
- ▶ **Town** – Implement under special circumstances

Cost – \$\$

Timeline – Temporary or Permanent
Engineering Study Required – Yes

Potential Traffic Calming Benefits

- Speed Reduction ■
- Volume Reduction ■
- Conflict Reduction ■
- Natural Environment □

Implementation Considerations

- Local Vehicle Access □
- Emergency Vehicle Response ■
- Cycling Use ■
- Traffic Enforcement □
- Vehicle Parking ■
- Street Maintenance ■

- /□ No Benefit/Impact
- /■ Minor Benefit/Impact
- /■ Substantial Benefit/Impact

2. HORIZONTAL DEFLECTION

2.2 Curb Radius Reduction

Description and Purpose

A curb radius reduction is the reconstruction or modification of an intersection corner with a smaller radius, usually between the 3.0 m to 5.0 m range.

The purpose is to slow down right-turning vehicles, reduce crossing distances for pedestrians, and to improve visibility of pedestrians. This measure will not be considered where there is frequent bus/truck turning.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$-\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

- | | |
|---------------------|-------------------------------------|
| Speed Reduction | <input checked="" type="checkbox"/> |
| Volume Reduction | <input type="checkbox"/> |
| Conflict Reduction | <input type="checkbox"/> |
| Natural Environment | <input checked="" type="checkbox"/> |

Implementation Considerations

- | | |
|----------------------------|-------------------------------------|
| Local Vehicle Access | <input type="checkbox"/> |
| Emergency Vehicle Response | <input checked="" type="checkbox"/> |
| Cycling Use | <input checked="" type="checkbox"/> |
| Traffic Enforcement | <input type="checkbox"/> |
| Vehicle Parking | <input type="checkbox"/> |
| Street Maintenance | <input checked="" type="checkbox"/> |

- | | |
|---|----------------------------|
| <input type="checkbox"/> / <input type="checkbox"/> | No Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Minor Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Substantial Benefit/Impact |

2. HORIZONTAL DEFLECTION

2.3 Lateral Shift

Description and Purpose

A lateral shift in a roadway occurs where an otherwise straight section is redesigned using pavement markings or curb extensions to create a curvilinear alignment (a 'jog') in the roadway like a chicane. This effect can also be achieved with the use of a central island.

A lateral shift causes drivers to have to negotiate the alignment and increases awareness aimed at reducing vehicle speeds.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Grade** – < 8%
- ▶ **Town** – Primary measure

Cost – \$-\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

- | | |
|---------------------|-------------------------------------|
| Speed Reduction | <input checked="" type="checkbox"/> |
| Volume Reduction | <input type="checkbox"/> |
| Conflict Reduction | <input type="checkbox"/> |
| Natural Environment | <input type="checkbox"/> |

Implementation Considerations

- | | |
|----------------------------|-------------------------------------|
| Local Vehicle Access | <input type="checkbox"/> |
| Emergency Vehicle Response | <input type="checkbox"/> |
| Cycling Use | <input type="checkbox"/> |
| Traffic Enforcement | <input type="checkbox"/> |
| Vehicle Parking | <input checked="" type="checkbox"/> |
| Street Maintenance | <input type="checkbox"/> |

- | | |
|---|----------------------------|
| <input type="checkbox"/> / <input type="checkbox"/> | No Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Minor Benefit/Impact |
| <input checked="" type="checkbox"/> / <input type="checkbox"/> | Substantial Benefit/Impact |

2. HORIZONTAL DEFLECTION

2.4 Speed Kidney

Description and Purpose

A speed kidney is an arrangement of three speed humps elongated with a curvilinear shape in the direction of traffic. Vehicle drivers choosing to drive in a straight path will experience discomfort as two or four wheels traverse the different parts of the speed kidney. Vehicles are required to take a curvilinear path to avoid the vertical deflection.

Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Location** – Midblock, Intersection
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Grade** – < 5%
- ▶ **Town** – Implement under special circumstances

Cost – \$-\$\$

Timeline – Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

- | | |
|---------------------|-------------------------------------|
| Speed Reduction | <input checked="" type="checkbox"/> |
| Volume Reduction | <input type="checkbox"/> |
| Conflict Reduction | <input type="checkbox"/> |
| Natural Environment | <input checked="" type="checkbox"/> |

Implementation Considerations

- | | |
|----------------------------|-------------------------------------|
| Local Vehicle Access | <input type="checkbox"/> |
| Emergency Vehicle Response | <input type="checkbox"/> |
| Cycling Use | <input checked="" type="checkbox"/> |
| Traffic Enforcement | <input type="checkbox"/> |
| Vehicle Parking | <input checked="" type="checkbox"/> |
| Street Maintenance | <input checked="" type="checkbox"/> |

- | | |
|---|----------------------------|
| <input type="checkbox"/> / <input type="checkbox"/> | No Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Minor Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Substantial Benefit/Impact |

2. HORIZONTAL DEFLECTION

2.5 Traffic Button/Traffic Circle/Mini-Roundabout

Description and Purpose

A traffic button/traffic circle/mini-roundabout is an island located at the centre of an intersection, which requires vehicles to travel in a counter-clockwise direction around the island.

Mini-roundabouts are designed in accordance with full-size roundabout design principles incorporating splitter islands and deflection of vehicles on all approaches, except that they have a smaller diameter and traversable islands. A traffic circle is typically smaller than a mini-roundabout and does not have splitter islands on the approaches. A traffic button is like a traffic circle. However, the former is typically made of coloured asphalt while the latter is landscaped.

The turning radius for left-turning trucks, buses, or emergency vehicles may require a diameter which would be larger than the intersection space available. Consequently, vehicles may turn left in front of the traffic circle or mount the centre raised island rather than travelling around the measure.

Yield traffic control is recommended.

Cost – \$-\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban and rural
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – < 1500 vpd
- ▶ **Town** – Implement to address intersection conflicts, where space permits

Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input checked="" type="checkbox"/>
Natural Environment	<input checked="" type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input checked="" type="checkbox"/>
Cycling Use	<input checked="" type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input checked="" type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

3. ROADWAY NARROWING

3.1 Curb Extension

Description and Purpose

A curb extension (also known as neckdown, choker, curb bulb, or bulb-out) is a horizontal intrusion of the curb into the roadway resulting in a narrow section of roadway. The curb is extended on one or both sides of the roadway to reduce its width to as little as 6.0 m for two-lane, two-way traffic. In urban environments, it is possible to implement curb extensions by removing existing parking spaces.

The purpose of a curb extension is to reduce vehicle speeds, reduce crossing distance for pedestrians, increase visibility of pedestrians, and prevent parking close to an intersection.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 60 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$\$-\$\$\$

Timeline – Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input checked="" type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input checked="" type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input checked="" type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

3. ROADWAY NARROWING

3.2 Lane Narrowing

Description and Purpose

Lane narrowing is the process of reducing lane widths using pavement markings or other features (for example, bicycle lanes, street beautification programs, pavement texture).

The intention is for drivers to perceive the roadway to be less comfortable at higher speeds due to the narrowing of the lanes and ultimately reduce operating speeds.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 60 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$-\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

- | | |
|---------------------|-------------------------------------|
| Speed Reduction | <input checked="" type="checkbox"/> |
| Volume Reduction | <input type="checkbox"/> |
| Conflict Reduction | <input checked="" type="checkbox"/> |
| Natural Environment | <input type="checkbox"/> |

Implementation Considerations

- | | |
|----------------------------|-------------------------------------|
| Local Vehicle Access | <input type="checkbox"/> |
| Emergency Vehicle Response | <input checked="" type="checkbox"/> |
| Cycling Use | <input checked="" type="checkbox"/> |
| Traffic Enforcement | <input type="checkbox"/> |
| Vehicle Parking | <input checked="" type="checkbox"/> |
| Street Maintenance | <input type="checkbox"/> |

- | | |
|---|----------------------------|
| <input type="checkbox"/> / <input type="checkbox"/> | No Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Minor Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Substantial Benefit/Impact |

3. ROADWAY NARROWING

3.3 On-Street Parking

Description and Purpose

On-street parking is the reduction of the roadway width available for vehicle movement by allowing motor vehicles to park adjacent and parallel to the curb. Angled parking is not appropriate as a traffic calming measure, due to the increased potential for conflicts.

The effect of using on-street parking to narrow the effective roadway space is to reduce vehicle speeds and to reduce possible short-cutting or through traffic.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Implement in accordance with Town By-laws

Cost – \$-\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

- | | |
|---------------------|-------------------------------------|
| Speed Reduction | <input checked="" type="checkbox"/> |
| Volume Reduction | <input type="checkbox"/> |
| Conflict Reduction | <input type="checkbox"/> |
| Natural Environment | <input checked="" type="checkbox"/> |

Implementation Considerations

- | | |
|----------------------------|-------------------------------------|
| Local Vehicle Access | <input type="checkbox"/> |
| Emergency Vehicle Response | <input checked="" type="checkbox"/> |
| Cycling Use | <input checked="" type="checkbox"/> |
| Traffic Enforcement | <input type="checkbox"/> |
| Vehicle Parking | <input type="checkbox"/> |
| Street Maintenance | <input checked="" type="checkbox"/> |

- | | |
|---|----------------------------|
| <input type="checkbox"/> / <input type="checkbox"/> | No Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Minor Benefit/Impact |
| <input checked="" type="checkbox"/> / <input type="checkbox"/> | Substantial Benefit/Impact |

3. ROADWAY NARROWING

3.4 Raised Median Island

Description and Purpose

A raised median island is an elevated median constructed on the centerline of a two-way roadway to reduce the overall width of the adjacent travel lanes.

The purpose of a raised median island is to reduce vehicle speeds and to reduce pedestrian-vehicle conflicts.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterials
- ▶ **Roadway Cross-Section** – Urban and rural, two-lane
- ▶ **Speed Limit** – 60 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Implement where width permits and/or road reconstruction projects

Cost – \$\$-\$\$\$

Timeline – Permanent

Engineering Study Required – Yes



Source: www.pedbikesafe.org

Potential Traffic Calming Benefits

- | | |
|---------------------|-------------------------------------|
| Speed Reduction | <input checked="" type="checkbox"/> |
| Volume Reduction | <input type="checkbox"/> |
| Conflict Reduction | <input checked="" type="checkbox"/> |
| Natural Environment | <input type="checkbox"/> |

Implementation Considerations

- | | |
|----------------------------|-------------------------------------|
| Local Vehicle Access | <input checked="" type="checkbox"/> |
| Emergency Vehicle Response | <input type="checkbox"/> |
| Cycling Use | <input type="checkbox"/> |
| Traffic Enforcement | <input type="checkbox"/> |
| Vehicle Parking | <input checked="" type="checkbox"/> |
| Street Maintenance | <input checked="" type="checkbox"/> |



No Benefit/Impact



Minor Benefit/Impact



Substantial Benefit/Impact

3. ROADWAY NARROWING

3.5 Road Diet

Description and Purpose

A road diet is a reconfiguration of a roadway where the number of travelled lanes and/or effective width of the road is reduced to allocate the reclaimed space for other uses, such as widen sidewalks, turning lanes, bus lanes, pedestrian refuge islands, bike lanes, parking, etc.

Typically, a Road Diet involves converting an existing four-lane, undivided roadway segment to a three-lane segment consisting of two through lanes, a centre two-way left-turn lane, and two bicycle lanes. However, other conversions are possible, such as 4-lane to 5-lane, 2-lane to 3-lane, 3-lane to 3-lane, and 5-lane to 3-lane.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 60 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$ - \$\$

Timeline – Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input checked="" type="checkbox"/>
Natural Environment	<input checked="" type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input checked="" type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input type="checkbox"/>	Substantial Benefit/Impact

3. ROADWAY NARROWING

3.6 Vertical Centreline Treatment

Description and Purpose

The use of vertical treatments such as flexible post-mounted delineators or raised pavement markers to create a centre median. This could be used to give drivers a perception of lane narrowing and create a sense of constriction.

Flexible post-mounted delineators are similar in appearance to bollards. They are commonly used in work zones, high-occupancy vehicle (HOV) lanes, and on-ramp exits to direct vehicles or prevent certain movements.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Rural Arterials
- ▶ **Roadway Cross-Section** – Urban and rural, two-lane
- ▶ **Speed Limit** – 80 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

4. SURFACE TREATMENT

4.1 Sidewalk Extension/ Textured Crosswalk

Description and Purpose

A sidewalk extension is a sidewalk continued across a local street intersection at the level of the roadway.

Textured/patterned elements that contrast the roadway can be incorporated into the sidewalk extension.

The purpose of a sidewalk extension is to visually enhance a pedestrian crossing location so drivers become more aware of its presence. It is not intended to indicate whether drivers or pedestrians are required to yield (traffic must comply with local or provincial regulations governing the type of pedestrian crossing system being enhanced by the sidewalk extension / textured crosswalk).

With a sidewalk extension/textured crosswalk the continuation of the surface and enhanced visual/tactile identification of the crosswalk area emphasizes pedestrian priority.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban Arterials
- ▶ **Roadway Cross-Section** – Urban, sidewalks on both sides
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Implement to facilitate pedestrian crossings, streetscape projects



Cost – \$-\$\$

Timeline – Permanent

Engineering Study Required – Yes

Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input checked="" type="checkbox"/>
Natural Environment	<input checked="" type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input checked="" type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

4. SURFACE TREATMENT

4.2 Textured Pavement

Description and Purpose

Textured pavement is roadway pavement that incorporates a textured and/or patterned surface which contrasts other adjacent roadways in the surrounding area. The difference in texture alerts drivers of the potential need to reduce speed.

Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Streetscape projects

Cost – \$-\$\$

Timeline – Permanent

Engineering Study Required – No



Potential Traffic Calming Benefits

- | | |
|---------------------|-------------------------------------|
| Speed Reduction | <input checked="" type="checkbox"/> |
| Volume Reduction | <input type="checkbox"/> |
| Conflict Reduction | <input type="checkbox"/> |
| Natural Environment | <input checked="" type="checkbox"/> |

Implementation Considerations

- | | |
|----------------------------|-------------------------------------|
| Local Vehicle Access | <input type="checkbox"/> |
| Emergency Vehicle Response | <input type="checkbox"/> |
| Cycling Use | <input checked="" type="checkbox"/> |
| Traffic Enforcement | <input type="checkbox"/> |
| Vehicle Parking | <input type="checkbox"/> |
| Street Maintenance | <input checked="" type="checkbox"/> |

- | | |
|---|----------------------------|
| <input type="checkbox"/> / <input type="checkbox"/> | No Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Minor Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Substantial Benefit/Impact |

4. SURFACE TREATMENT

4.3 Transverse Rumble Strips

Description and Purpose

Transverse rumble strips are raised buttons, bars or grooves closely spaced at regular intervals on the roadway that create both noise and vibration in a moving vehicle.

The purpose of a rumble strip is to alert motorists to a traffic control device which is associated with unusual or changing conditions ahead. Rumble strips are sometimes incorrectly used in a standalone mode as a speed control device.

With rumble strips, motorists are alerted by minor vertical deflection of vehicle wheels and audible warning created as vehicles wheels pass over.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Rural Arterials
- ▶ **Roadway Cross-Section** – Urban and rural (usually one lane per direction)
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$

Timeline – Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

- | | |
|---------------------|-------------------------------------|
| Speed Reduction | <input checked="" type="checkbox"/> |
| Volume Reduction | <input type="checkbox"/> |
| Conflict Reduction | <input type="checkbox"/> |
| Natural Environment | <input type="checkbox"/> |

Implementation Considerations

- | | |
|----------------------------|-------------------------------------|
| Local Vehicle Access | <input type="checkbox"/> |
| Emergency Vehicle Response | <input type="checkbox"/> |
| Cycling Use | <input checked="" type="checkbox"/> |
| Traffic Enforcement | <input type="checkbox"/> |
| Vehicle Parking | <input type="checkbox"/> |
| Street Maintenance | <input checked="" type="checkbox"/> |

- | | |
|---|----------------------------|
| <input type="checkbox"/> / <input type="checkbox"/> | No Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Minor Benefit/Impact |
| <input checked="" type="checkbox"/> / <input type="checkbox"/> | Substantial Benefit/Impact |

5. PAVEMENT MARKINGS

5.1 Converging Chevrons

Description and Purpose

Converging chevrons are pavement markings painted in the shape of a forward facing V pointing in the roadway travel direction. They can be spaced close together or painted thinner to create the illusion that a vehicle's speed is increasing. This is done to alert the driver of the need to reduce speed.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterials
- ▶ **Roadway Cross-Section** – Urban and rural
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$-\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

5. PAVEMENT MARKINGS

5.2 Dragon's Teeth

Description and Purpose

Dragon's teeth are a series of triangular pavement markings along the edge of the travelled lanes. They may be painted with increasing size to give the impression of roadway narrowing. They provide a visual change of the roadway and alert drivers that they are entering a rural community.



Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterials
- ▶ **Roadway Cross-Section** – Urban and rural
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$

Timeline – Temporary or Permanent

Engineering Study Required – Yes

Potential Traffic Calming Benefits

- | | |
|---------------------|--------------------------|
| Speed Reduction | <input type="checkbox"/> |
| Volume Reduction | <input type="checkbox"/> |
| Conflict Reduction | <input type="checkbox"/> |
| Natural Environment | <input type="checkbox"/> |

Implementation Considerations

- | | |
|----------------------------|-------------------------------------|
| Local Vehicle Access | <input type="checkbox"/> |
| Emergency Vehicle Response | <input type="checkbox"/> |
| Cycling Use | <input type="checkbox"/> |
| Traffic Enforcement | <input type="checkbox"/> |
| Vehicle Parking | <input type="checkbox"/> |
| Street Maintenance | <input checked="" type="checkbox"/> |

- | | |
|---|----------------------------|
| <input type="checkbox"/> / <input type="checkbox"/> | No Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Minor Benefit/Impact |
| <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> | Substantial Benefit/Impact |

5. PAVEMENT MARKINGS

5.3 Full-lane Transverse Bars

Description and Purpose

Full-lane transverse bars are a series of parallel pavement markings which extend across the majority of the travelled lane width. The series of markings may be placed closer together with distance to create the illusion that a vehicle's speed is increasing to alert the driver of the need to reduce speed.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterials
- ▶ **Roadway Cross-Section** – Urban and rural
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

5. PAVEMENT MARKINGS

5.4 On-Road Sign Pavement Markings

Description and Purpose

On-road 'sign' pavement markings provide information that would typically be shown to drivers through signage but are painted on the roadway to provide a larger image, and one that is directly in the driver's line of sight. Some examples could be speed limit, 'SLOW', 'Stop ahead', etc.



Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterials
- ▶ **Roadway Cross-Section** – Urban and rural
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Compliments other measures

Cost – \$

Timeline – Temporary or Permanent

Engineering Study Required – Yes

Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

5. PAVEMENT MARKINGS

5.5 Peripheral Transverse Bars

Description and Purpose

Peripheral transverse bars are a series of parallel pavement markings along the edge of the travelled lane widths. The series of markings may be placed closer together with distance to create the illusion that a vehicle's speed is increasing. This is done to alert the driver's awareness of the need to reduce speed. Peripheral transverse bars are similar to full-lane transverse bars but require less maintenance of pavement markings.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterials
- ▶ **Roadway Cross-Section** – Urban and rural
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Primary measure

Cost – \$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

6. ACCESS RESTRICTIONS

6.1 Directional Closure

Description and Purpose

A directional closure is a curb extension or vertical barrier extending to approximately the centerline of a roadway, effectively obstructing (prohibiting) one direction of traffic.

When combined with other measures elsewhere in a neighborhood, directional closures obstruct short-cutting or through traffic routes.

Bicycles are typically permitted to travel through a directional closure in both directions, including the direction in which motor vehicle traffic is obstructed. In some cases, gaps or a contra-flow bicycle lane are used to provide bicycle access.



Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Location** – Midblock, Intersection
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – <1500 vpd
Local, 1500 to 5000 vpd Collector Road
- ▶ **Town** – Consider for volume reduction in the context of the network design

Cost – \$-\$\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes

Potential Traffic Calming Benefits

Speed Reduction	■
Volume Reduction	■
Conflict Reduction	□
Natural Environment	□

Implementation Considerations

Local Vehicle Access	■
Emergency Vehicle Response	□
Cycling Use	□
Traffic Enforcement	□
Vehicle Parking	□
Street Maintenance	□

□/□	No Benefit/Impact
■/■	Minor Benefit/Impact
■/■	Substantial Benefit/Impact

6. ACCESS RESTRICTIONS

6.2 Diverter

Description and Purpose

A diverter is a raised barrier placed diagonally across an intersection that forces traffic to turn and prevents traffic from proceeding straight through the intersection. Diverters can incorporate gaps for pedestrians, wheelchairs and bicycles and can be mountable by emergency vehicles.

The purpose of a diverter is to obstruct and redirect short-cutting or through traffic.

Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban and rural
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – < 1500 vpd, use with caution for volumes up to 5000 vpd
- ▶ **Town** – Consider for volume reduction in the context of the network design

Cost – \$-\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input type="checkbox"/>
Volume Reduction	<input checked="" type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input checked="" type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input checked="" type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

6. ACCESS RESTRICTIONS

6.3 Full Closure

Description and Purpose

A full closure is a barrier extending the entire width of a roadway, which obstructs all motor vehicle traffic movements from continuing along the roadway. A closure can change a four-way intersection to a three-way intersection, or a three-way intersection to a non-intersection. Gaps can be provided for cyclists or to allow for emergency vehicles.

The purpose of a full closure is to eliminate short-cutting or through traffic.

Applicability

- ▶ **Road Class** – Local Streets and Collector Roads
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 50 km/h or less
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Consider for volume reduction in the context of the network design

Cost – \$\$-\$\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input type="checkbox"/>
Volume Reduction	<input checked="" type="checkbox"/>
Conflict Reduction	<input checked="" type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input checked="" type="checkbox"/>
Emergency Vehicle Response	<input checked="" type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>



No Benefit/Impact



Minor Benefit/Impact



Substantial Benefit/Impact

6. ACCESS RESTRICTIONS

6.4 Intersection Channelization

Description and Purpose

Intersection channelization is the use of raised islands or bollards located in an intersection to obstruct specific traffic movements and physically direct traffic through an intersection.

Intersection channelization can improve pedestrian crossing safety by reducing crossing distances and providing refuge areas.

Bicycles are typically permitted to make all movements, including those which motor vehicles are prevented from making. Gaps in channelization islands may be used to accommodate bicycles.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Consider for volume reduction in the context of the network design

Cost – \$-\$\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Source: www.stocktongov.com

Potential Traffic Calming Benefits

Speed Reduction	<input type="checkbox"/>
Volume Reduction	<input checked="" type="checkbox"/>
Conflict Reduction	<input checked="" type="checkbox"/>
Natural Environment	<input checked="" type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input checked="" type="checkbox"/>
Emergency Vehicle Response	<input checked="" type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

6. ACCESS RESTRICTIONS

6.5 Raised Median Through Intersection

Description and Purpose

A raised median through an intersection is a concrete or asphalt island located on the centerline of a two-way roadway through an intersection, which prevents left turns and through movements to and from the intersecting roadways. It can create a refuge for pedestrians and cyclists, enabling them to cross one direction of travel at a time, thereby reducing waiting time for gaps when crossing the roadway.

The purpose of a raised median through an intersection is to obstruct short-cutting or through traffic and reduce crossing distance for pedestrians.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Consider for volume reduction in the context of the network design

Cost – \$-\$\$\$

Timeline – Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input type="checkbox"/>
Volume Reduction	<input checked="" type="checkbox"/>
Conflict Reduction	<input checked="" type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input checked="" type="checkbox"/>
Emergency Vehicle Response	<input checked="" type="checkbox"/>
Cycling Use	<input checked="" type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input checked="" type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

6. ACCESS RESTRICTIONS

6.6 Right-In/Right-Out Island

Description and Purpose

A right-in / right-out island is a raised triangular island at an intersection approach which obstructs left turns and through movements to and from the intersecting street or driveway.

Bicycles are typically permitted to make left turns and through movements from the side street, either through gaps or depressions in the island, or by travelling around the island.

The purpose of a right-in / right-out island is to obstruct short-cutting or through traffic.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Consider for volume reduction in the context of the network design

Cost – \$-\$\$

Timeline – Temporary or Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input type="checkbox"/>
Volume Reduction	<input checked="" type="checkbox"/>
Conflict Reduction	<input checked="" type="checkbox"/>
Natural Environment	<input checked="" type="checkbox"/>

Implementation Considerations

Local Access	<input checked="" type="checkbox"/>
Emergency Vehicle Response	<input checked="" type="checkbox"/>
Cycling Use	<input checked="" type="checkbox"/>
Traffic Enforcement	<input checked="" type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

7. GATEWAYS

Description and Purpose

Gateways are the combination of traffic calming devices, that help to provide an entry or “gateway” which identifies transitional zones such as between commercial/rural areas and urban/rural residential zones, villages, or hamlets.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterials
- ▶ **Roadway Cross-Section** – Urban and rural
- ▶ **Speed Limit** – All speed limits
- ▶ **Average Daily Traffic** – All volumes
- ▶ **Town** – Site specific, compliments other measures

Cost – \$-\$\$

Timeline – Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input checked="" type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

8. SHARED SPACE

Description and Purpose

Shared space is a design concept commonly used in Europe where the priority for users is shifted from vehicles towards cyclists and pedestrians as they are free to cross anywhere. Often, there are no pavement markings, traffic signals, signs or barriers which requires drivers to be more attentive. There may also be trees or street furniture in the roadway to act as deflections. This shared use reduces vehicles speeds and encourages better public spaces for the community.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, and Urban Arterials
- ▶ **Roadway Cross-Section** – Urban
- ▶ **Speed Limit** – 50 km/h or less, lower to 20-30 km/h
- ▶ **Average Daily Traffic** – <15,000 vpd
- ▶ **Town** – Site specific, implemented as part of road reconstruction or new development

Cost – \$-\$\$

Timeline – Permanent

Engineering Study Required – Yes



Potential Traffic Calming Benefits

- Speed Reduction ■
- Volume Reduction □
- Conflict Reduction □
- Natural Environment ■

Implementation Considerations

- Local Vehicle Access □
- Emergency Vehicle Response ■
- Cycling Use □
- Traffic Enforcement □
- Vehicle Parking □
- Street Maintenance ■



No Benefit/Impact



Minor Benefit/Impact



Substantial Benefit/Impact

9. ENFORCEMENT AND EDUCATION

9.1 Speed Display Devices

Description and Purpose

A speed display device is an interactive sign that displays vehicle speeds as oncoming motorists approach. Vehicle speed is captured using radar and can trigger the display board to show when vehicles approach at predetermined undesirable speeds. Can be used upstream of targeted speed enforcement.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterial Roads
- ▶ **Town** – Prior to implementing physical traffic calming and/or compliments other measures

Cost – \$

Timeline – Temporary or Permanent

Engineering Study Required – No



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input checked="" type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

9. ENFORCEMENT AND EDUCATION

9.2 Targeted Speed Enforcement

Description and Purpose

Targeted speed enforcement involves employing additional police enforcement in locations when speed, collision, citation, resident comments, or other sources of information suggest that the site is unusually hazardous due to illegal driving practices.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterial Roads
- ▶ **Town** – Prior to implementing physical traffic calming and/or compliments other measures

Cost – \$\$\$

Timeline – Temporary

Engineering Study Required – No



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input checked="" type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

9. ENFORCEMENT AND EDUCATION

9.3 Targeted Education Campaign

Description and Purpose

Targeted education campaigns are initiatives to raise awareness of road safety issues. Education campaigns can address multiple types of driver awareness. In some cases, these will be an integral component of an overall strategic road safety program.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterial Roads
- ▶ **Town** – Prior to implementing physical traffic calming and/or compliments other measures

Cost – \$-\$\$\$

Timeline – n/a

Engineering Study Required – No



Potential Traffic Calming Benefits

Speed Reduction	<input type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Other Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

9. ENFORCEMENT AND EDUCATION

9.4 Vehicle Actuated Signs (VAS)

Description and Purpose

Vehicle actuated signs are electronic roadside warning signs equipped with radar speed detectors and illuminated display.

Vehicle activated signs are like speed feedback signs but instead of showing the speed of the vehicle, the speed is used to activate a symbol displaying the actual hazard ahead when a predetermined speed threshold is exceeded. Otherwise, the sign shows no message.

The purpose is to alert drivers with the aim that they reduce their travel speed as they approach specific conditions or hazards ahead.

Applicability

- ▶ **Road Class** – Local Streets, Collector Roads, Urban and Rural Arterial Roads
- ▶ **Town** – Prior to implementing physical traffic calming and/or compliments other measures

Cost – \$

Timeline – Temporary or Required

Engineering Study Required – Yes



Potential Traffic Calming Benefits

Speed Reduction	<input checked="" type="checkbox"/>
Volume Reduction	<input type="checkbox"/>
Conflict Reduction	<input checked="" type="checkbox"/>
Natural Environment	<input type="checkbox"/>

Other Implementation Considerations

Local Vehicle Access	<input type="checkbox"/>
Emergency Vehicle Response	<input type="checkbox"/>
Cycling Use	<input type="checkbox"/>
Traffic Enforcement	<input type="checkbox"/>
Vehicle Parking	<input type="checkbox"/>
Street Maintenance	<input checked="" type="checkbox"/>

<input type="checkbox"/> / <input type="checkbox"/>	No Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Minor Benefit/Impact
<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	Substantial Benefit/Impact

Appendix B

Traffic Calming Toolkit Decision Matrix

Measure		Road Class			Cross-Section	Location	Speed Limit	Average Daily Traffic	Grade	Notes
		Local or Collector	Urban Arterial	Rural Arterial						
1. Vertical Deflection										
1.1	Raised Crosswalk	●	✗	✗	Urban ¹	n/a	≤ 50 km/h		≥ 1%, but ≤ 8%	Implement to facilitate pedestrian connections
1.2	Raised Intersection	●	✗	✗	Urban	n/a	≤ 50 km/h		≥ 1%, but ≤ 8%	Site specific, considered as part of road reconstruction projects or new development
1.3	Speed Cushion	●	✗	✗	Primarily Urban	n/a	≤ 50 km/h		< 8%	Primary measure
1.4	Speed Hump	●	✗	✗	Urban	n/a	≤ 50 km/h		< 8%	Implement where a speed cushion is not effective
	Speed Table	●	✗	✗						
2. Horizontal Deflection										
2.1	Chicane (One-Lane, Two-Lane) ²	●	✗	✗	Urban	n/a	≤ 50 km/h	≥ 750 vpd	< 8%	Implement under special circumstances
2.2	Curb Radius Reduction	●	▲	✗	Urban	n/a	n/a			Primary measure
2.3	Lateral Shift	●	▲	✗	Urban	n/a	≤ 50 km/h		< 8%	Primary measure
2.4	Speed Kidney	●	✗	✗	Urban	Midblock or Intersection	≤ 50 km/h		< 5%	Implement under special circumstances
2.5	Traffic Button/	●	✗	✗	Urban and Rural	n/a	≤ 50 km/h	< 1,500 vpd	n/a	Implement to address intersection conflicts (where space permits)
	Traffic Circle/Mini-Roundabout	●	✗	▲						
3. Roadway Narrowing										
3.1	Curb Extension	●	●	✗	Urban	n/a	≤ 60 km/h		n/a	Primary measure
3.2	Lane Narrowing	●	▲	✗	Urban	n/a	≤ 60 km/h		n/a	Primary measure
3.3	On-Street Parking	●	▲	✗	Urban	n/a	≤ 50 km/h		n/a	Implement in accordance with Town by-laws
3.4	Raised Median Island	●	▲	●	Urban and Rural ²	Two-lane roads	≤ 60 km/h		n/a	Implement where width permits and/or alongside reconstruction projects
3.5	Road Diet ⁶	●	●	✗	Urban	n/a	≤ 60 km/h		n/a	Primary measure
3.6	Vertical Centreline Treatment	●	✗	●	Urban and Rural	Two-lane roads	≤ 80 km/h		n/a	Primary measure
4. Surface Treatment										
4.1	Sidewalk Extension/Textured Crosswalk	●	▲	✗	Urban ¹	n/a	≤ 50 km/h		n/a	Implement to facilitate pedestrian crossings, streetscape projects
4.2	Textured Pavement	●	✗	✗	Urban	n/a	≤ 50 km/h		n/a	Consider in streetscape projects
4.3	Transverse Rumble Strips	▲	✗	●	Urban and Rural	n/a	n/a		n/a	Primary measure
5. Pavement Markings										
5.1	Converging Chevrons	●	▲	●	Urban and Rural	n/a	n/a		n/a	Primary measure
5.2	Dragon's Teeth	●	▲	●	Urban and Rural	n/a	n/a		n/a	Primary measure
5.3	Full-lane Transverse Bars	●	▲	●	Urban and Rural	n/a	n/a		n/a	Primary measure
5.4	On-Road 'Sign' Pavement Markings	●	●	●	Urban and Rural	n/a	n/a		n/a	Compliments other measures
5.5	Peripheral Transverse Bars	●	▲	●	Urban and Rural	n/a	n/a		n/a	Primary measure

Measure		Road Class			Cross-Section	Location	Speed Limit	Average Daily Traffic	Grade	Notes
		Local or Collector	Urban Arterial	Rural Arterial						
6. Access Restriction										
6.1	Directional Closure	●	×	×	Urban	Midblock or Intersection	n/a	Local: < 1,500 vpd Collector: 1,500 – 5,000 vpd	n/a	Consider for volume reduction within the context of the network design
6.2	Diverter	●	×	×	Urban and Rural	n/a	≤ 50 km/h	< 1,500 vpd	n/a	
6.3	Full Closure	●	×	×	Urban	n/a	≤ 50 km/h		n/a	
6.4	Intersection Channelization	●	▲	×	Urban	n/a	n/a		n/a	
6.5	Raised Median Through Intersection	●	▲	×	Urban	n/a	n/a		n/a	
6.6	Right-in/Right-out Island	●	▲	×	Urban	n/a	n/a		n/a	
7. Gateways										
7.1	Gateways	●	●	●	Urban and Rural	n/a	n/a		n/a	Site specific, compliments other measures
8. Shared Space										
8.1	Shared Space	●	▲	×	Urban	n/a	≤ 50 km/h	< 15,000 vpd	n/a	Site specific, implemented as part of road reconstruction or new development
9. Enforcement and Education										
9.1	Speed Display Devices	●	●	●	n/a	n/a	n/a		n/a	Use prior to implementing physical traffic calming and/or compliments other measures
9.2	Targeted Speed Enforcement	●	●	●	n/a	n/a	n/a		n/a	
9.3	Targeted Education Campaign	●	●	●	n/a	n/a	n/a		n/a	
9.4	Vehicle Activated Signs	●	●	●	n/a	n/a	n/a		n/a	

Legend:

● Applicable ▲ Use with Care × Not Appropriate

Notes:

- 1. Consider only if sidewalk is on at least one side of road
- 2. Consider on two-lane roads