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Traffic Calming Policy

May 2023



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Consulting Engineers

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1. Introduction

1.1 Introduction and Background

As part of its mandate to build and maintain a safe and efficient roadway system for all users, the Municipality of Leamington actively implements geometric and traffic control improvements that have been proven effective in addressing road safety. The Municipality is committed to “Vision Zero” and accepts its fundamental message: fatalities and serious injuries on our roads are preventable, and traffic-related deaths and injuries should be minimized towards “zero”. One of the primary programs through which the road authority’s mandate is accomplished is via the targeted implementation of traffic calming measures; when applied appropriately, traffic calming measures can have a positive impact on travel speeds, traffic volumes, and overall road safety. When the rules of the roads are not followed, traffic calming measures may be needed to restore the roadway to its intended function. Specifically, traffic calming measures are intended to enhance the pedestrian and cyclist environment so that area residents can feel safe when walking or cycling through local neighbourhoods; often, these measures also offer features that enhance a community’s identity.

The purpose of this Traffic Calming Policy is to provide a systematic procedure for the initiation, investigation, and implementation of traffic calming measures for existing and future roadways in the Municipality of Leamington. It is intended to supplement the TAC’s *Canadian Guide to Traffic Calming* and *Geometric Design Guide for Canadian Roads* with “Leamington-specific” considerations.

1.2 Speeding in Leamington

Speeding within the Municipality has been an on-going concern voiced by residents and Council. Both urban and rural residents often raise concerns about the speed of vehicles on their streets and in their neighbourhoods. In response, this document is intended to guide stakeholders and decision-makers in addressing specific speeding concerns.

1.3 Procedural Framework

The goal of this policy document is to provide a clear and concise procedural framework from which the Municipality’s Administration and the public may initiate, investigate, and implement traffic calming measures on roads within the Municipality of Leamington’s jurisdiction; this policy document also provides design guidance via typical applications / configurations and references to existing standards, where applicable. The policy and associated procedures ensure that there is a formal process for evaluating traffic calming requests with respect to site-specific screening and criteria. Ideally, new developments should use this policy document as a reference / resource, wherever applicable.



2. Traffic Calming

2.1 What is Traffic Calming?

Traffic calming uses geometric design and other physical measures to improve safety for motorists, pedestrians, and cyclists. It has become a tool to combat speeding and other unsafe behaviours of drivers circumnavigating through residential neighbourhoods. Traffic calming is designed to encourage safer, more responsible driving, to improve the quality of life for residents / non-motorized street users on calmed streets, and to potentially reduce overall motor vehicle volumes. Effectively, traffic calming aims to improve the enjoyment and “active transportation” friendliness of a community by implementing proven methods for reducing overall vehicle speeds and volumes.

Traffic engineers and transportation planners refer to three “E’s” when discussing traffic calming: engineering, (community) education, and (police) enforcement. Since neighbourhood traffic studies often indicate that area residents contribute to the perceived speeding problem, traffic calming initiatives are most successful when the mitigation strategies include all three “E” components.

2.2 Goals and Objectives

The fundamental goal of all traffic calming strategies is to make streets slower and safer in support of their intended purpose, thereby preserving and enhancing the quality of individual communities. Implementing neighbourhood traffic calming can:

Increase Safety for All Road Users:

Traffic calming efforts to alter driver behaviour can reduce the risk of collisions and injuries. The resulting reduction in travel speeds and traffic volumes can create a safer environment for all right-of-way users.

Improve Quality of Life:

Motor vehicles create noise, pollution, and visual intrusion, which often reduce a resident’s perception of their community’s quality of life. Residents report feeling safer when traffic calming efforts are put in place to minimize the speed and volume of through traffic.

Restore Roads to Their Intended Purpose:

From a roadway classification perspective, local roads are intended to accommodate low to moderate traffic volumes that travel at low speeds to / from adjacent roadway networks. Traffic calming can be used to deter through traffic and reduce traffic volumes within the neighbourhood.



2.3 Advantages and Disadvantages

General advantages and disadvantages are outlined in Table 1, below:

Table 1: Traffic Calming Advantages and Disadvantages

Traffic Calming Advantages	Traffic Calming Disadvantages
<ul style="list-style-type: none"> • Reduces vehicle speeds • Reduces traffic volume • Discourages through traffic • Improves overall road safety • Improves neighbourhood livability • Reduces conflicts between road users 	<ul style="list-style-type: none"> • Increases emergency vehicle response time • Reduces ease of access to / from neighbourhoods • Results in expensive solutions (time and resources) • Diverts traffic onto neighbouring roadways • Increases maintenance time and costs • Results in some visually unattractive measures

2.4 Other Considerations

Permanent engineered traffic calming measures can be costly and difficult to modify once implemented. Therefore, several topics must be discussed prior to implementing a traffic calming measure, particularly if existing policies and / or standards may preclude or contradict the proposed initiatives.

2.4.1 Potential Liability

Municipal decision-makers are often concerned by potential liabilities that may result from the introduction of traffic calming measures on public roadways under their jurisdiction. Although these concerns continue to be voiced, experience has proven that the most effective means of mitigating the risk of litigation is to establish and follow a set procedure / policy document. Policy documents should include an approval guide, a defined process, a design guideline and standards, a uniform approach to signing and marking roadway environments, and a prudent maintenance program that addresses the additional attention required when operating in traffic-calmed areas. Although the applied procedures and / or policy documents may not eliminate potential liability exposure risks, it is believed that the benefits associated with traffic calming far outweigh the risks involved. It should also be noted that the road authority may be held liable due to their inaction, particularly if procedures, policies, and / or reports conclude that traffic calming measures are warranted within the context of a community.



2.4.2 Accessibility

Traffic calming measures should consider the needs of all road users, of all ages and abilities, and not impede or negatively impact their independence or safety.

2.4.3 Emergency Services

While traffic calming has the potential to slow down motor vehicle traffic, it can also affect emergency service response times. Traffic calming designs have progressed in mitigating impacts to emergency service vehicles; however, prior to implementation, the proposed traffic calming measures should be evaluated with respect to the Municipality's emergency response times and equipment to ensure that the recommended changes are compatible with efficiencies required by emergency services.

2.4.4 Maintenance and Operations

To ensure that traffic calming measures do not conflict with general road maintenance operations, consultation with operations and maintenance staff is recommended. Traffic calming measures typically impact maintenance needs and costs, which must be considered in addition to the upfront capital costs. Snow clearing, street sweeping, drainage, and infrastructure damage are common concerns expressed by operations and maintenance workers.

2.4.5 Modes of Transportation

Active transportation must be considered in the application of traffic calming measures, particularly because traffic calming is intended to enhance the safety of all right-of-way users. For example, any traffic calming measure implemented on a transit or cycling route must make accommodation for these modes of transportation.

2.4.6 Municipal / County Master Plans

Traffic calming policies and the implementation of traffic calming measures should be incorporated into other short-term and long-term plans to ensure uniformity across the entire Municipality.

2.4.7 Provincial Legislation / Municipal By-Laws

Existing legislation and / or by-laws may impact the implementation of traffic calming in a community. While the Municipality has no control over provincial legislation, slight modifications to by-laws may be required to ensure that the traffic calming policy does not conflict with current and relevant by-laws.



3. Traffic Calming Measures

Traffic calming measures can be classified into two categories: physical and non-physical.

3.1 Physical Measures

Physical calming measures, also known as engineering measures, involve physically altering the road layout or appearance to actively or passively reduce traffic speeds. Physical measures include:

- *raised crosswalks*
- *raised intersections*
- *speed cushions*
- *speed humps*
- *speed tables*
- *chicanes*
- *curb radius reductions*
- *traffic circles*
- *roundabouts*
- *curb extensions*
- *on-street parking spaces*
- *raised median islands*
- *road diets*
- *textured crosswalks*
- *transverse rumble strips*

3.2 Non-Physical Measures

Non-physical calming measures are usually implemented through enforcement, signage, and pavement markings. Non-physical measures include:

- *pavement marking legends*
- *speed enforcements*
- *pace cars*
- *speed display devices*
- *targeted education programs*



3.3 Current Traffic Calming Measures

Traffic calming measures are already in place on multiple roadways within the Municipality of Leamington. The following treatments have already been applied within the urban boundary:

- raised intersections
- speed cushions
- speed humps
- chicanes
- curb radius reductions
- roundabouts
- curb extensions
- on-street parking spaces
- raised median islands
- textured pavements

For specifics on each traffic calming measure and its respective advantages and disadvantages, please refer to the content provided in Appendix A.

4. Traffic Calming Policy

4.1 Consideration for Traffic Calming

Traffic calming measures should only be considered under the following circumstances:

- when there is a demonstrated safety or speed concern and when acceptable alternative measures have been exhausted;
- when education and enforcement efforts have failed to produce the desired results;
- after arterial road network improvements have been explored (ie. signal timing optimization);
- when new plans of subdivision are being considered;
- when the roadway is predominately restricted to two lane roads (one lane in each direction);
- when motor vehicle access to municipal roadways is relatively well-maintained; and
- after staff has thoroughly investigated existing traffic conditions.

Traffic calming measures should never:

- impede non-motorized, alternative modes of transportation, such as walking or cycling; or
- impede emergency and transit services access, unless arrangements have been made.



4.2 Municipal Administration Involvement

Broader administration (public works, emergency services, etc.) should be consulted in each application; however, following internal circulation of the proposal and consideration of the resulting commentary, any final decisions should be made at the discretion of Engineering Services. Monitoring and follow-up studies should be completed to evaluate effectiveness of the prescribed treatment. Ideally, a before / after study should be undertaken, with the results provided to the affected community and to Council.

4.3 Community Involvement

Restoring neighbourhood streets to their intended purpose and improving overall livability are primary objectives of traffic calming. To achieve this goal, community involvement and support is paramount. Communication with residents should be made at various development and implementation stages. Traffic calming plans should be developed with an understanding of current and historical traffic patterns within the area under investigation. For a traffic calming plan to be successful, the community must support and be committed to the solution. The only means of gaining this commitment is to involve the residents. Community involvement is also beneficial in mitigating vocal opposition, and it enhances the credibility of the traffic calming program, particularly when it is presented to Council for approval. To obtain a working partnership with the community, public meetings should be scheduled with area residents; furthermore, surveys should be delivered to residents affected by the proposed traffic calming measures. These forms of contact will provide the community with opportunities to offer their input into the development of the plan, which may enhance publicity and awareness of the study.

The review and implementation of traffic calming measures is a time consuming and expensive process; it often requires many resources. However, without public support, the measures intended to alleviate traffic concerns could be met with negative public opinion, which may jeopardize the outcome and potential positive impacts to affected neighbourhoods. A combination of community support, enforcement, education, appropriate engineering application, and economics typically determine the outcome of any traffic calming measure. A cooperative partnership between the affected residents and the Municipality is essential to a project's success.

4.4 Future Developments

Regarding new area developments, a traffic calming review should be conducted during the draft plan design stage. Traffic calming should be discussed during pre-consultation, and at the road authority's discretion, a traffic calming plan should be included as part of the transportation impact assessment (TIA) submission. Upon review of the plan, any recommended traffic calming measures must be added to the respective development's draft plan conditions.



4.5 Class Environmental Assessment Process

Traffic calming is exempt from the Ontario Environmental Assessment Act and is not an undertaking subject to the *Municipal Engineers Association Municipal Class Environmental Assessment* (October 2000, as amended in 2007, 2011, and 2015). Under the proposed 2020 MEA Class EA Amendments, the implementation of traffic calming measures is to be a Schedule A+ undertaking. Schedule A+ projects are pre-approved, provided that the public is advised prior to implementation.

5. Traffic Calming Process

Traffic calming is most often requested by a resident (or group) representing a larger neighbourhood / community, and the concerns are most often related to speed and / or traffic volumes on a particular street in the neighbourhood. When a request has been made for traffic calming in the Municipality of Leamington, the following process will be used. A corresponding flow chart is provided in Appendix B.

To improve the requesting process, it is recommended that staff explore the development of a standard submission form for the initial screening process. This form should be placed on the Municipality's webpage, along with the warrant and other prominent information. Staff could also consider the development of an electronic form which could be submitted directly from the webpage. A sample Traffic Calming Request Form is provided in Appendix C.

5.1 Step 1: Traffic Calming Request

To initiate the traffic calming process, the concern of the resident(s) must be made in writing to the Municipality, accompanied by a petition, to investigate traffic calming in their neighbourhood or on a specific roadway. Municipal staff will provide a copy of the petition to the proponent. A petition must be presented to the Municipality to establish whether there is sufficient neighborhood support for traffic calming prior to initiating an investigation into the need for such measures. The petition serves as a preliminary screening tool that prevents unsupported traffic calming requests from being advanced.

The petition results must clearly demonstrate that a minimum of 25% of the dwelling units with direct frontage onto the candidate roadway or section support the potential implementation of traffic calming measures. Each dwelling unit represents one signature, regardless of the number of people in the unit. If the minimum support threshold of 25% is not met, the investigation will be *terminated*. Successful petitions (i.e. those that satisfy the required 25% support threshold) will advance to municipal screening. A local Councillor may also initiate the traffic calming process during a regular meeting of Council or after having met with the public. The process can also be initiated at the sole discretion of Administration (based on known issues from speed studies), as identified internally or by a third-party.



5.2 Step 2: Town Screening

Following a successful request for traffic calming consideration, municipal staff will evaluate the requested location using the initial screening criteria provided in Table 2. A request must pass the preliminary screening to proceed to the evaluation.

Table 2: Screening Criteria

Initial Screening Criteria	Yes	No
<u>Posted Speed</u> Urban: Is the posted speed 50 km/hr or lower? Rural: Is the posted speed 60 km/hr or lower?		
<u>Annual Average Daily Traffic</u> Does the location have a minimum AADT volume of 100 vehicles?		
<u>Street Length</u> Does the road have a minimum uncontrolled (i.e. no stop signs or traffic signals) length of 120 metres?		
<u>Grade</u> Is the vertical grade less than 6%?		
<u>Previous Evaluation</u> Has not been evaluated within the last 24 months?		

In addition, the following must also be satisfied:

- all reasonable efforts must be made to address the concerns utilizing other means such as education and enforcement tools; and
- zoning should be primarily residential.

If the subject neighbourhood or road does not satisfy the above criteria, it will not be considered a candidate for traffic calming. Furthermore, while traffic calming is primarily focused on local roads, at the discretion of municipal administration, staff may review select collector and arterial roads if they meet the aforementioned criteria.



For locations meeting the initial screening criteria, a speed study will be conducted to determine whether speeding is occurring within the study area. For vehicle speeds, the 85th percentile speed is typically considered, which is the speed at or below which 85% of the total traffic volume on a road is travelling. The assumption underlying the 85th percentile speed is that most drivers will operate their vehicle at speeds they perceive to be safe. Ideally, the 85th percentile speed should be ± 10 km/hr of the posted speed limit.

In considering the need for traffic calming, the 85th percentile speed must exceed the posted speed limit by the values provided in the below table:

Table 3: 85th Percentile Speed Considerations

Posted Speed Limit (km/h)	85 th Percentile Speed (km/h)	Exceedance of Speed Limit (km/h)
40	50	+10
50	60	+10
60	70	+10
70	80	+10
80	90	+10

If the observed 85th percentile travel speed exceeds the posted speed limit by the threshold noted in Table 3, the subject road will be identified as a candidate for traffic calming measures and will proceed to Step 3. If the subject road does not exceed the noted thresholds, the subject road will be disqualified from consideration.

5.3 Step 3: Data Collection

If the subject roadway satisfies the petition requirements and the initial screening criteria, additional data will be collected. Municipal staff (or their consultants) will conduct the necessary traffic studies to qualify and quantify the submitted traffic concern. Data collection is essential to provide a better understanding of the current traffic conditions and to aid in the selection of traffic calming measures.

The data collection process is focused on collecting two specific traffic characteristics for each location of concern: traffic speed and volume. Speed and volume are dynamic and can be time-sensitive; therefore, any related data kept in the Municipality’s database should be updated regularly. If the data is more than two years old, consideration should be given to updating the information to complete the Traffic Calming Warrant evaluation.



5.4 Step 4: Traffic Calming Warrant and Points Criteria

Once the subject location has been deemed eligible through the initial screening process (and the necessary data is collected), the next step is to evaluate the roadway based on the warrant criteria using the Traffic Calming Warrant and Points system. These criteria will only be used to determine project prioritization. Locations with higher score should be implemented first. See [Section 5.7](#) for further details. The warrant criteria and applicable point system are provided in the below tables:

Table 4: Traffic Calming Warrant and Points Criteria for Local Roads

Criteria	Points	Max. Points
Local Roads		
Travel Speeds	2 points for every km/h (85 th percentile) over the posted speed limit (Ex.: If 85 th percentile speed is 58 km/h in a 50 km/h zone = 16 points)	25
Traffic Volumes	1 point for every 100 AADT (starting from 0) (Ex.: 1,000 AADT = 10 points)	25
Presence of Schools	7.5 points for each school located along the roadway 5 points for designated school walking routes that are along the roadway	15
Other Pedestrian Generators	5 points for each community generator (ie. park, school, recreation centre, senior's centre, community centre, place of worship) with a direct link to the roadway (frontage, trail, sidewalk, or other access point) 10 points for a signed bicycle route	25
Collisions	5 points for each preventable collision within the past three years 10 points for two or more preventable collisions within the past three years 10 points for every preventable collision recorded which resulted in personal injury within the past three years	25



Table 5: Traffic Calming Warrant and Points Criteria for Collector Roads

Criteria	Points	Max. Points
Collector Roads		
Travel Speeds	1 point for every km/h (85 th percentile) over the posted speed limit (Ex.: If 85 th percentile speed is 58 km/h in a 50 km/h zone = 8 points)	25
Traffic Volumes	1 point for every 200 AADT (starting from 0) (Ex.: 1,000 AADT = 5 points)	25
Presence of Schools	7.5 points for each school located along the roadway 5 points for designated school walking routes that are along the roadway	15
Other Pedestrian Generators	5 points for each community generator (ie. park, school, recreation centre, senior's centre, community centre, place of worship) with a direct link to the roadway (frontage, trail, sidewalk, or other access point) 10 points for a signed bicycle route	25
Collisions	5 points for each preventable collision within the past three years 10 points for two or more preventable collisions within the past three years 10 points for every preventable collision recorded which resulted in personal injury within the past three years	25

5.5 Step 5: Preliminary Design and Review

To determine potential traffic calming measures, a thorough review of the data collected in Steps 3 and 4 (as well as site visits, existing road geometry, visibility constraints, historical information, future maintenance, construction plans, and resident feedback) will be taken into consideration. Appropriate traffic calming measures will be determined based on (but not limited to) the current list of traffic calming measures provided in [Section 3.3](#) of this policy. The appropriate traffic calming design will be selected by the Municipality of Leamington based on the design guidelines outlined in the *Canadian Guide to Traffic Calming* and the engineering judgement of staff.

First, the proposed treatment will be presented to emergency and/or roadside operations services for review and comment. Feedback from potentially affected services will be encouraged, and municipal staff will work with agencies to modify the design wherever possible.



5.6 Step 6: Community Notification

After approval from emergency and / or roadside operations, the Municipality will notify the public to present the purpose, objectives, and implementation process corresponding to the recommended traffic calming treatment. Staff will determine the community notification limits, which may include surrounding roads and neighbourhoods. At a minimum, dwelling units with direct frontage (or whose side yard abuts the subject roadway section) should be notified.

5.7 Step 7: Prioritization

Based on the available annual budget, the Municipality of Leamington will conduct a prioritization assessment using Tables 4 and 5. Locations with the highest points should be implemented first. If funding does not permit all locations to be implemented within one calendar year, eligible roadways should be carried forward to the next year and re-prioritized to include any new locations. While the goal is to implement traffic calming measures according to the priority ranking, locations with a lower ranking may be implemented ahead of higher-ranking projects if funding does not permit the pending projects to be implemented; this will ensure that the maximum available funding will be utilized.

5.8 Step 8: Final Design and Implementation

Before the implementation process begins, detailed engineering drawings should be prepared; these drawings should provide a high level of detail with respect to the following:

- surface drainage;
- sub-base requirements;
- surface type;
- road grade;
- signage;
- line painting;
- sight lines;
- landscaping;
- driveway and intersection locations; and
- utility locations and/or relocations.

Upon approval of Council, resident notification, and sufficient funding, the recommended traffic calming measures will be implemented. The Municipality will notify affected residents of the respective implementation timelines. Where feasible, staff may phase in the traffic calming plan by applying temporary or removable measures, which will allow time for examination of the impact and effectiveness of the recommended measures prior to their permanent application.



Appropriate temporary traffic calming measures include (but are not limited to) the following options:

- calming curbs;
- flexible bollards;
- concrete bumper blocks (with delineators);
- temporary / seasonal speed humps or tables;
- pavement markings; and
- speed display devices.

5.9 Step 9: Monitor and Evaluate

Municipal staff should monitor the traffic calming measures to determine their effectiveness and impact on the surrounding road network. This information may be used for future recommendations of traffic calming treatments within the Municipality of Leamington.



Appendix A

PHYSICAL MEASURES

A.1 Permanent Measures

A.2 Temporary Measures

Appendix A.1

PERMANENT MEASURES

Raised Crosswalks

A **raised crosswalk** is a marked pedestrian crosswalk constructed at a higher elevation than the adjacent roadway.

The objective of a raised crosswalk is to enhance awareness of pedestrian crossings, reduce vehicle speeds, improve pedestrian visibility, and reduce pedestrian-vehicle conflict.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ Improves pedestrian visibility➤ Pedestrian crossing area is better defined➤ Traffic noise may be reduced➤ Police enforcement is not required	<ul style="list-style-type: none">➤ Emergency response is slightly delayed➤ Active transportation / transit operations may experience delay➤ Maintenance and roadway operations may be affected	Low - Medium

Raised Intersections

A **raised intersection** is an intersection that may include crosswalks; it is constructed at a higher elevation than the adjacent roadway.

The objective of a raised intersection is to enhance awareness of pedestrian crossings, reduce vehicle speeds, improve pedestrian visibility, and reduce pedestrian-vehicle conflict.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none"> ➤ Vehicle speeds are reduced ➤ Improves pedestrian visibility ➤ Pedestrian crossing area is better defined ➤ Traffic noise may be reduced ➤ Police enforcement is not required 	<ul style="list-style-type: none"> ➤ Emergency response is slightly delayed ➤ Active transportation / transit operations may experience delay ➤ Maintenance and roadway operations may be affected 	Medium - High

Speed Cushions

A **speed cushion** is a raised area on the roadway, but it does not cover the entire roadway width; the width is designed to allow larger vehicles, such as a bus or firetruck, to “straddle” the cushion, while smaller vehicles will have at least one side of the vehicle deflected upward.

The objective of a speed cushion is to cause discomfort for drivers travelling at higher speeds, which results in reduced vehicle speeds.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none"> ➤ Vehicle speeds are reduced ➤ Traffic noise may be reduced ➤ Easy to construct ➤ Deters cut-through traffic ➤ Police enforcement is not required 	<ul style="list-style-type: none"> ➤ Emergency response is slightly delayed ➤ Active transportation / transit operations may experience delay ➤ Maintenance and roadway operations may be affected ➤ Added wear-and-tear on vehicles over time 	<p>Medium - High</p>

Speed Humps

A **speed hump** is a raised area built across the entire roadway; it causes the vertical upward movement of a traversing vehicle.

The objective of a speed hump is to cause discomfort for drivers travelling at higher speeds, which results in reduced vehicle speeds.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ Easy to construct➤ Deters cut-through traffic➤ Police enforcement is not required	<ul style="list-style-type: none">➤ Emergency response is delayed➤ Active transportation / transit operations may experience delay➤ Maintenance and roadway operations may be affected➤ Added wear-and-tear on vehicles over time	Low - Medium

Speed Tables

A **speed table** is an elongated speed hump with a flat-topped section that is long enough to raise the entire wheelbase of a passenger car.

The objective of a speed table, like a speed hump, is to cause discomfort for drivers travelling at higher speeds, therefore, reducing vehicle speeds.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none"> ➤ Traffic noise may be reduced ➤ Vehicle speeds are reduced ➤ Easy to construct ➤ Deters cut-through traffic ➤ Police enforcement is not required 	<ul style="list-style-type: none"> ➤ Emergency response is delayed ➤ Active transportation / transit operations may experience delay ➤ Maintenance and roadway operations may be affected ➤ Added wear-and-tear on vehicles over time 	<p>Low - Medium</p>

Chicanes

A **chicane** is a series of curb extensions on alternating sides of a roadway, which narrow the roadway and force drivers to steer from one side of the roadway to the other to travel through the chicane.

The objective of a chicane is to discourage shortcutting and / or through traffic and to reduce vehicle speeds.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none"> ➤ Vehicle speeds are reduced ➤ Traffic volumes are reduced ➤ Increases motorist awareness ➤ Traffic noise may be reduced ➤ Discourages shortcutting ➤ Police enforcement is not required 	<ul style="list-style-type: none"> ➤ Emergency response is delayed ➤ Loss of on-street parking ➤ Active transportation / transit operations may experience delay ➤ Maintenance and roadway operations may be affected 	Medium

Curb Radius Reductions

A **curb radius reduction** is the reconstruction of an intersection corner to accommodate a smaller (tighter) radius.

The objective of curb radius reductions is to reduce speeds of right-turning vehicles, reduce crossing distances for pedestrians, and to improve visibility of pedestrians.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none"> ➤ Vehicle speeds are reduced for right-turning traffic ➤ Improves pedestrian visibility ➤ Pedestrian crossing distance is reduced ➤ Traffic noise may be reduced ➤ Police enforcement is not required 	<ul style="list-style-type: none"> ➤ Emergency response may be delayed ➤ Active transportation / transit operations may experience delay ➤ Maintenance and roadway operations time may be increased 	Low - Medium

Traffic Circles / Roundabouts

A **traffic circle / roundabout** is a circular island located at the centre of an intersection, which requires vehicles to circulate through the intersection in a counter-clockwise direction.

The objective of traffic circles / roundabouts is to reduce vehicle speeds and to minimize the speed / impact of intersection conflicts.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none"> ➤ Vehicle speeds are reduced ➤ Traffic volumes may be reduced ➤ Collision rates are reduced ➤ Traffic noise may be reduced ➤ Police enforcement is not required 	<ul style="list-style-type: none"> ➤ Emergency response times may be delayed ➤ Active transportation / transit operations may experience delay ➤ Maintenance and roadway operations time may be increased ➤ Restricted access for trucks and longer school buses 	Medium - High

Curb Extensions

A **curb extension** (also known as neckdown, choker, curb bulb, or bulb-out) is a horizontal intrusion of the curb visually and physically narrowing the roadway width. The curb may be on one or both sides of the roadway.

The objective of curb extensions is to reduce vehicle speeds, reduce crossing distance for pedestrians, increase visibility of pedestrians, and prevent parking too close to an intersection.



<i>Advantages</i>	<i>Disadvantages</i>	<i>Relative Cost</i>
<ul style="list-style-type: none"> ➤ Vehicle speeds are reduced ➤ Improves pedestrian visibility ➤ Pedestrian crossing distance is reduced ➤ Police enforcement is not required 	<ul style="list-style-type: none"> ➤ Emergency response times may be delayed ➤ Potential loss of on-street parking ➤ May interrupt bike lanes ➤ Maintenance and roadway operations time may be increased 	Low - Medium

On-Street Parking

On-street parking reduces the roadway width available for vehicle movement (in addition to providing surplus parking opportunities along a street segment).

The objective of on-street parking (as a traffic calming measure) is to reduce traffic speeds by narrowing the effective roadway space and to discourage potential short-cutting.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none"> ➤ Vehicle speeds are reduced ➤ Provides buffer between traffic and pedestrians on sidewalks ➤ Traffic volumes may be reduced ➤ Police enforcement is not required ➤ Deters cut-through traffic 	<ul style="list-style-type: none"> ➤ Emergency response times may be delayed ➤ Potential loss of on-street parking ➤ Maintenance and roadway operations time may be increased ➤ Driveway visibilities may be reduced ➤ Increases risk of side 	Low - Medium

Raised Median Island

A **raised median island** is an elevated median constructed at the centreline of a two-way roadway, reducing the overall width of the adjacent travel lanes.

The objective of raised medians is to reduce traffic speeds by narrowing the effective roadway space and to reduce the number of potential conflict areas.

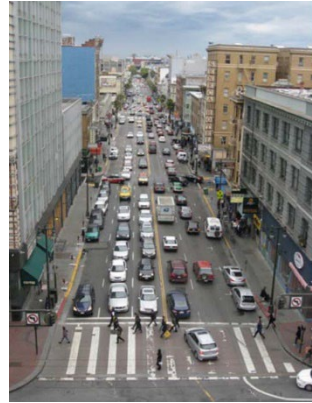


Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ Traffic volumes may be reduced➤ Provides refuge for pedestrians➤ Police enforcement is not required	<ul style="list-style-type: none">➤ Emergency response times may be delayed➤ May reduce on-street parking➤ May restrict driveway access➤ Additional maintenance if landscaped	Medium - High

Road Diet

A **road diet** is a reconfiguration of the roadway whereby the number of travel lanes and/or effective width of the road is reduced.

The objective of road diets is to reduce speeds by limiting vehicular servicing capacity and reallocating the reclaimed space for other uses (ie. wider sidewalks, turning lanes, bus lanes, refuge islands, bike lanes, parking, etc.)



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none"> ➤ Vehicle speeds are reduced ➤ Traffic volumes may be reduced ➤ Provides refuge for pedestrians ➤ Police enforcement is not required 	<ul style="list-style-type: none"> ➤ Emergency response times may be delayed ➤ May reduce on-street parking ➤ May restrict driveway access ➤ Additional maintenance if landscaped 	Low - High

Textured Crosswalk

A **textured crosswalk** is comprised of a different colour and / or texture than the roadway to highlight the pedestrian crossing area.

The objective of textured crosswalks is to reduce potential pedestrian-vehicle conflicts by visually enhancing the controlled crossing areas.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ Improves pedestrian safety➤ Police enforcement is not required	<ul style="list-style-type: none">➤ Increased maintenance➤ Traction or stability problems for seniors, disabled individuals, wheelchairs, etc.	Low - Medium

Transverse Rumble Strips

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

The objective of transverse rumble strips is to alert drivers of an upcoming stop after travelling on a roadway at higher speeds of travel.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ Requires little to no maintenance➤ Police enforcement is not required	<ul style="list-style-type: none">➤ Maintenance and roadway operations time may be increased	Low

Appendix A.2

TEMPORARY MEASURES

Calming Curbs

Calming curbs are large, yellow, slabs of concrete which are placed on the road to provide temporary traffic calming. Calming curbs are yellow and have plastic reflective posts or signs installed on them to increase their visibility.

The objective of calming curbs is to narrow the roadway to encourage drivers to reduce speeds.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ Improves pedestrian safety➤ Requires little to no maintenance➤ Police enforcement is not required	<ul style="list-style-type: none">➤ Reduced separation between oncoming vehicles➤ Maintenance and roadway operations time may be increased	Low

Flexible Bollards

Flexible bollards are flexible plastic posts spaced evenly along a roadway. Without physically constraining the roadway environment, flexible bollards alert drivers of a separation requirement.

The objective of flexible bollards is to narrow the perceived roadway width and to alter driver behaviour.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ Requires little to no maintenance➤ Police enforcement is not required	<ul style="list-style-type: none">➤ Maintenance and roadway operations time may be increased	Low

Concrete Bumper Blocks (with Delineators)

Concrete bumper blocks (with delineators) are concrete units used as a barrier between vehicles and pedestrians.

The objective of concrete bumper blocks (with delineators) is to create a barrier between moving vehicles and pedestrians.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ Requires little to no maintenance➤ Increases pedestrian safety	<ul style="list-style-type: none">➤ Maintenance and roadway operations time may be increased	Low

Seasonal Speed Humps / Tables

*A **seasonal speed hump / table** is a rubber unit that is placed across the entire roadway width; it causes the vertical upward movement of a traversing vehicle.*

The objective of a seasonal speed hump / table is to cause discomfort for drivers travelling at higher speeds, which results in reduced vehicle speeds.



<i>Advantages</i>	<i>Disadvantages</i>	<i>Relative Cost</i>
<ul style="list-style-type: none"> ➤ Vehicle speeds are reduced ➤ Easy to construct ➤ Deters cut-through traffic ➤ Police enforcement is not required 	<ul style="list-style-type: none"> ➤ Emergency response is delayed ➤ Active transportation / transit operations may experience delay ➤ Maintenance and roadway operations may be affected ➤ Added wear-and-tear on vehicles over time 	Low - Medium

Pavement Markings

Pavement markings are painted lines on a roadway, which aid in perceptively narrowing the travel lanes. These markings can be painted in various styles / configurations.

The objective of pavement markings (related to traffic calming) is to influence drivers to reduce speeds by creating optical effects that affect driver behaviour.



Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ No impact to emergency vehicles➤ Can be implemented quickly	<ul style="list-style-type: none">➤ Regular maintenance will be required➤ May be less effective in winter months due to snow	Low

Speed Display Devices

A speed display device is an interactive sign that displays vehicle speeds as oncoming vehicles approach. Vehicle speeds are captured and reported using radar, and the device can flash when vehicles exceed a predetermined speed.

The objective of speed display devices is to alert drivers to their errant or unsafe travel speeds.

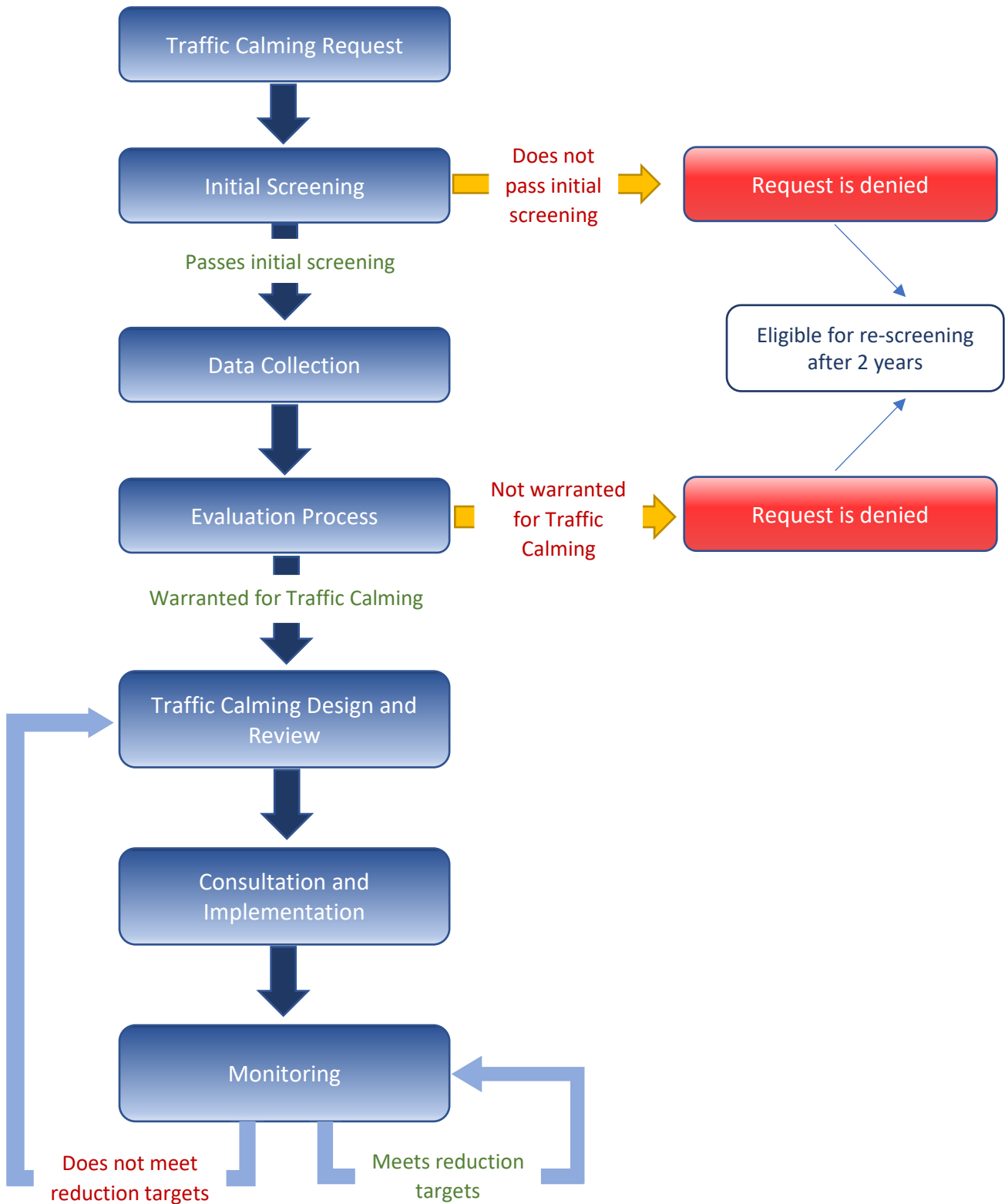


Advantages	Disadvantages	Relative Cost
<ul style="list-style-type: none">➤ Vehicle speeds are reduced➤ Reduction in speed related collisions➤ Police enforcement is not required	<ul style="list-style-type: none">➤ Requires regular maintenance➤ Driver behaviour may be unchanged if no further enforcement is observed	Low - Medium

Appendix B

TRAFFIC CALMING PROCESS FLOW CHART

Traffic Calming Process Flow Chart



Appendix C

TRAFFIC CALMING REQUEST SAMPLE FORM



TRAFFIC CALMING REQUEST FORM

Thank you for your interest in traffic calming in your neighbourhood. Please take a moment to read and fill out this form; it will assist staff with responding to your request in a timely fashion.

PRIMARY CONTACT INFORMATION OF REQUESTOR

Name:

Phone Number:

Email Address:

Address:

Postal Code:

LOCATION OF CONCERN

Street:

From:

To:

Describe your concern. Please indicate whether your concerns relate to speed or traffic volume; provide any other comments that might be helpful to municipal staff (ie. time of day, season, etc.).

Thank you for taking the time to report your traffic calming request.

Please address your request to:

The Municipality of Leamington

111 Erie Street North

Leamington, Ontario N8H 2Z9

Or by email to: engdept@leamington.ca

The request will be reviewed by municipal staff to better understand the applicability of traffic calming measures. Thank you for your feedback. For more information on the Municipality of Leamington Traffic Calming Policy, please visit: <https://www.leamington.ca/>

Appendix D

TRAFFIC CALMING TOOLBOX

Measure	Location Applicability						Cost
	Urban Streets			Rural Streets			
	Local	Collector	Arterial	Local	Collector	Arterial	
Communication and Enforcement							
Information Signage	✓	✓	✓	✓	✓	✓	\$
Speed Display Device	✓	✓	✓	✓	✓	✓	\$ \$ \$
Targeted Education Programs	✓	✓	✓	✓	✓	✓	\$ \$
Speed Enforcements	✓	✓	✓	✓	✓	✓	\$
Vertical Deflection							
Raised Crosswalks	✓	✓	✗	▲	▲	✗	\$ \$ \$
Raised Intersections	✓	✓	✗	▲	▲	✗	\$ \$ \$ \$ \$
Speed Cushions	✓	✓	✗	✓	✓	✗	\$ \$
Speed Humps	✓	✓	✗	✓	✓	✗	\$ \$
Speed Tables	✓	✓	✗	✓	✓	✗	\$ \$ \$
Flexible Bollards	✓	✓	✗	✓	▲	✗	\$
Horizontal Deflection							
Chicanes	✓	✓	✗	✗	✗	✗	\$ \$ \$ \$ \$
Curb Radius Reductions	✓	✓	▲	✗	✗	✗	\$ \$ \$ \$
Traffic Circles	✓	✓	▲	✗	✗	▲	\$ \$ \$ \$
Roundabouts	✓	✓	▲	✗	✗	▲	\$ \$ \$ \$ \$
Curb Extensions / Bulb-Outs	✓	✓	✓	✗	✗	✗	\$ \$ \$
On-Street Parking	✓	✓	▲	✓	✓	✗	\$
Raised Median Island	✓	✓	✓	✗	✗	✓	\$ \$
Road Diet	✓	✓	✓	✓	▲	✗	\$ \$
Concrete Bumper Blocks with Delineators	✓	▲	✗	✓	▲	✗	\$ \$
Surface Treatments							
Pavement Markings	✓	✓	✓	✓	✓	✓	\$
Textured Pavement	✓	✓	✗	✓	✓	✗	\$ \$
Transverse Rumble Strips	✓	✓	▲	✓	✓	✓	\$ \$
✓ = Appropriate Measure ▲ = Use with Caution ✗ = Not Recommended							