

**THE CORPORATION OF THE TOWN OF PERTH**

**BY-LAW NO. 4481**

**A By-law to adopt the Traffic Calming Policy**

**Recitals:**

1. *The Municipal Act*, as amended, states that by-laws may be passed by municipal councils to govern its affairs as it considers appropriate.
2. The Committee of the Whole reviewed Report 2014-COW-11.UB.1 and concurs with the staff recommendation to adopt the Traffic Calming Policy.
3. The Council for the Corporation of the Town of Perth deems it advisable to pass this By-law.

Accordingly, the Council of The Corporation of the Town of Perth enacts as follows:

**1. SCHEDULES**

- 1.1. That the Traffic Calming Policy attached hereto as Schedule "A" and forming part of this By-law, be and is hereby approved.

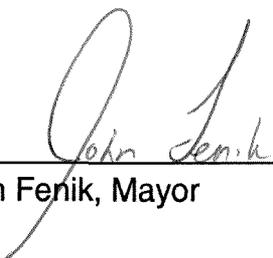
**2. PROVISIONS**

- 2.1. Where the provisions of any other by-laws/motions are inconsistent with the provisions of this By-law, the provisions of this By-law will prevail.

**3. EFFECTIVE DATE:**

- 3.1. This By-law shall come into force and effect on the date it is passed by Council.

Read a first, second and third time and finally passed this 25<sup>th</sup> day of November, 2014.

  
\_\_\_\_\_  
John Ferik, Mayor

  
\_\_\_\_\_  
Lauren Walton, Clerk

(Seal)

<b>Town of Perth</b>			
<b>Traffic Calming Policy</b>			
Subject:	<b>Traffic Calming Policy</b>	Effective:	<b>November 25, 2014</b>
Issued by:	Director of Environmental Services	Approval:	By-law No. 2014-4481

***To be a sustainable Community that respects both its Heritage and Natural Environment, while enabling a balanced lifestyle by means of a vibrant economy.***

## **1.0 PURPOSE**

The purpose of this policy is to provide a comprehensive process that addresses local neighbourhood traffic issues in the Town of Perth. The policy is intended to restore municipal streets based on an identified problem, to their intended function through applicable traffic calming measures, and to preserve and enhance the quality of Perth neighbourhoods.

The specific goal of this Traffic Calming Policy is to develop a set of overall working guidelines that will:

- a) Educate residents about traffic calming so they can make better- informed decisions and also understand the rationale behind the municipality’s decision-making process.
- b) Provide a policy that officials and the general public are confident is an effective and fair tool in evaluating speeding and/or traffic volume challenges.
- c) Provide a standard format for dealing in a consistent manner with complaints regarding speeding and traffic safety concerns.
- d) Educate people on how to create a safe and pleasant roadway environment for residents, motorists, cyclists and pedestrians.
- e) Encourage public involvement in the traffic calming activities.
- f) Educate residents on pedestrian and cyclist safety.

This Policy will also provide the guidelines, procedures, and criteria for the initiation, evaluation, and implementation of traffic calming measures within existing residential neighbourhoods. The policy will ensure safety concerns related to speeding and excessive volume are handled in a fair, transparent, and efficient manner. Guidelines included in this policy will be applied to local roadways within residential neighbourhoods only.

The Policy does not apply to collector or arterial roadways nor does it apply to anticipated future problems. This policy only applies to identify operational issues within existing residential areas. While similar traffic related issues may exist on arterial roadways, the primary function of an arterial road is to move traffic efficiently. Therefore, traffic calming measure(s) that may be appropriate for use on local roadways would not be suitable for use on arterial roadways.

## **2.0 SCOPE**

The municipality is responsible for ensuring roadways serve the needs of all users such as cars, pedestrians including those with accessibility needs, cyclists, emergency vehicles, and snow removal equipment. This Policy will support traffic calming measures that may be needed to restore the street to its intended function in the neighbourhood. It is critical that the problem statement and the correct tools are selected to quantify and address traffic movement issues. The goal of introducing traffic calming is to create safer and attractive streets, promote pedestrian and bicycle use, and improve the quality of life in residential neighbourhoods.

Traffic calming will be dealt with in a clear, concise, and transparent process that will meet the needs and expectations of the community. This document outlines how investigations into traffic calming measures should be initiated and implemented based on the experience gained by the Town of Perth and other Ontario municipalities.

This Policy shall include traffic calming with the following limits:

- a) **Safety** – Traffic calming and speed management can increase the safety of the roads for all road users, including pedestrians, cyclists, and motorists.
- b) **Appropriate driver behaviour** – Traffic calming and speed management can encourage driver behaviour that is appropriate for the class of the road and the environment of the road.

It is intended that these goals be pursued while maintaining the effectiveness of the road network for transporting people and goods. Objectives to achieve the goals of improving safety and encouraging appropriate driver behaviour include:

- a) **Minimize conflicts** – Reducing the potential for conflicts between road users may reduce the likelihood of a collision occurring, thereby improving safety, particularly for pedestrians, cyclists and other vulnerable road users.
- b) **Reduce vehicle speeds** – Speeds that are suitable in one neighbourhood may be considered excessive in another neighbourhood. Measures that reduce vehicle speeds may also help to reduce the likelihood of a collision and the severity of a collision. Reducing vehicle speeds also helps to improve the living environment of a community by reducing noise and other negative impacts of traffic.

### 3.0 **RESPONSIBILITY**

It is the responsibility of the Chief Administrative Officer and Town Directors to ensure compliance with this Policy.

### 4.0 **DEFINITIONS**

“**Arterial Road**” shall be a roadway intended to provide mobility into and through the municipality with ease as defined in the municipality’s Official Plan- Road Design Guideline Table.

“**Traffic calming**” is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behaviour, and improve conditions for non-motorized street users.

“**Base Speed**” shall be deemed to be 50km/h on local and collector roadways or unless posted with alternate speeds that are endorsed by municipal By-law.

“**Capital Asset**”, for the purpose of this Policy, refers to tangible goods with a lifespan greater than two (2) years with an initial purchase price of greater than \$1,000.

“**Chief Administrative Officer (CAO)**”, for the purpose of this Policy, shall mean the Chief Administrative Officer appointed by the Council of the Town of Perth.

“**Collector Road**” means a municipal roadway that is primarily used to convey vehicles and pedestrians from Arterial roadways to local/ collector roadways as defined in the municipality’s Official Plan-Road Design Guideline Table.

“**Directors**” shall mean Directors or Managers appointed from time to time by the Council of the Corporation of the Town of Perth.

“**Local Roadway**” shall mean roadways that are primarily used for local residential usage as defined in the municipality’s Official Plan- Road Design Guideline Table.

“**Selected Enforcement**” shall mean an activity of limited duration based on time of day, vehicle type, or event. It shall be activated by the Police Services using assembled background information, including but not limited to traffic data.

“**Pedestrian Responsibilities**” shall be defined as those responsibilities identified in Ontario Traffic Manual Book 15.

“**85<sup>th</sup> Percentile Speed**” shall be the speed at or below which 85 percent of people drive at any given street segment under good weather and visibility conditions and may be considered as the maximum safe speed for that location.

## **5.0 POLICY STATEMENT**

The intent of this Policy is to ensure the safety of the public within the Town of Perth when it relates to traffic movement on municipal roadways. This policy brings an objective process to public concerns about traffic movements on local roads throughout the municipality.

## **6.0 TRAFFIC CALMING PROCESS**

The Policy responds to traffic concerns with a coordinated and expeditious review of traffic conditions by staff. A request, which may specify physical traffic calming treatment, may be resolved through a normal review process before triggering a detailed study. Conversely, a general complaint may eventually lead to a traffic calming or speed management assessment, in order to address a valid traffic safety issue. A process flow chart is included in the policy as Appendix 1. When it has been determined that the traffic issue has been resolved initiators of the process and members of Council will be advised.

## **7.0 INITIATION**

### **7.1. Traffic Calming Request from Public**

In order for traffic calming to achieve the goal of restoring residential streets to their intended purpose, community involvement and support is paramount. Stakeholders are encouraged to participate in the development of a traffic calming plan suitable to the neighbourhood and the concerns within it.

Stakeholders with traffic related concerns are instructed to submit their written request to investigate traffic calming within their neighbourhood to the municipality using the Petition Letter identified in Appendix 2.

The municipality is responsible for the initiation, distribution, and collection of the Traffic Calming petition to ensure consistency of the process by managing the collection of public input and this will be done in a manner that incorporates community involvement. The focus of the petition will determine on whether or not there is neighbourhood support to initiate an investigation into the need for traffic calming on the requested roadway.

A minimum of twenty-five percent (25%) of property owners within the impact area must indicate their approval by signing the Traffic Calming Petition. The signatures must come from households that abut or flank the section of roadway that has been identified as the location for the potential implementation of traffic calming measures. Each household is represented by one signature, regardless of the number of people in the household. This step in the process is crucial in determining the level of concern from the residents. Failure to meet the 25% support level will result in termination of the investigation; meeting the required 25% support level will trigger the commencement of a traffic calming study.

Please note, if the petition contains less than the required 25% support level and the Director deems it to be a significant safety issue, the request may proceed.

## **7.2. Pre-screen Process by staff**

Staff will then conduct a brief preliminary assessment to determine if the requested roadway meets the initial screening criteria, shown in Appendix 3. Prescreening of the project may include any of the following:

1. Road classification;
2. Quantified vehicle count;
3. Posted speed;
4. Zoning of neighbourhood;
5. Traffic flow patterns;
6. Length of street segment;
7. Street entrances and exits;
8. Traffic calming history on segment, and;
9. Special consideration(s).

## **8.0 EVALUATION**

### **8.1 Data Collection**

To compile the essential data necessary to complete an evaluation of the corridor, the following minimum items shall be considered:

- Vehicle volume count to determine 24-hour traffic
- Speed study to determine existing speed data
- Classification count to determine heavy vehicle traffic
- Collision data for the most recent three (3) years
  - Study to quantify cut-through traffic, if necessary
  - Existing roadway conditions (e.g. pavement condition, signing, marking)
- Pedestrian activity
- Presence of sidewalks on one or both sides of the road
- Presence of special pedestrian generators such as schools, seniors' facilities, playgrounds, etc. abutting or immediately flanking the identified corridor.
- History of traffic operations for the area within last 5 years

A review of the data will be completed using recognized engineering standards. Once collected and summarized, the data will be utilized in the point assessment system to determine a total point value. This assessment will be used to determine the initial need for traffic calming and the advancement of the process.

The minimum number of points required to proceed with the investigation of traffic calming measures differs based on the condition of the roadway. Based on this, the following are minimum point values for each road.

### **8.2 Scoring**

The point assessment system is a screening process focused on the various attributes of a roadway in order to quantify its potential need for traffic calming. By means of assigning weighted points based on the severity of certain road attributes (e.g. 85th percentile speed), this process will bring to the forefront roadways requiring consideration while quantifying the current conditions. A point assessment tool is provided in Appendix 4 to determine the measurables of the traffic calming request.

The point assessment system will also be used to prioritize locations for consideration. Those locations with an extremely high point assessment will be given priority based on the quantitative nature of the point assessment system. Depending on funding availability, locations will be selected based on the point system, with those locations with the highest points constructed first. If funding does not permit all locations to be constructed in one year, roadways will be carried forward to the next year when they will then be re-prioritized to include any new locations.

Should a location fail to meet these requirements, residents will be notified in writing and the investigation for traffic calming measures will discontinue. However, staff will continue to address the concerns of the residents by means of the front-line mitigating measures.

Staff will provide the preferred design to the relevant review agencies (e.g. emergency and maintenance services). Comments from the potentially affected services will be solicited and feedback with respect to possible impacts will be encouraged. As required, Town staff will work with agencies to modify the design, as necessary. While it is preferable to modify the traffic calming design, if modifications are not able to remedy agency concerns, the traffic calming process will be discontinued for the roadway under consideration and residents will be notified.

If a street segment should qualify for traffic calming, installations shall proceed in the following order – passive measures then physical measures (horizontal and/or vertical).

### **8.3 Installation of Passive Traffic Calming Measures**

The use of passive traffic calming measures shall be the key tool to addressing the perceived traffic challenges in a corridor. Those tools listed in Appendix 5 shall be evaluated by staff to determine their applicability to the identified challenges. These tools shall be qualified by staff prior to moving onto the installation of physical traffic calming measures. Passive measures may allow a low cost approach to a neighbourhood challenge.

### **8.4 Evaluation of Passive Traffic Calming Measures**

The successes of passive traffic calming measures are to be quantified by municipal and Police Services staff. Quantification may include sampling the traffic movements by selected enforcement or by the installation of traffic monitoring equipment. If passive measures are deemed successful by both agencies, a report will be made to both Council and the petition initiators of the actions taken. A one-year evaluation of passive measures will be necessary to address completeness and seasonal challenges in the corridor.

### **8.5 Physical Traffic Calming Measures**

A number of Physical Traffic Calming tools are available in Appendix 6. These tools have specific advantages and installation applications. Physical Traffic Calming Measures will:

- a) Be considered only after passive measures including education, enforcement, and traffic engineering efforts have failed to produce the desired results.
- b) Be considered when there is a demonstrated safety, speed or short-cutting traffic concern and acceptable alternative measures have been exhausted.
- c) Be considered after focus is placed first on improvements to the road network, such as signal timing optimization.
- d) Include consideration as to whether an area-wide plan versus a street-specific plan is more suitable: an area wide plan should be considered if a street-specific plan would likely result in displacement of traffic onto adjacent streets.
- e) Be predominantly restricted to two lane roadways (one lane of through traffic in each direction) and a posted speed limit no greater than 50 km/h.

- f) Not impede non-motorized, alternative modes of transportation and be designed to ensure pedestrian and cycling traffic is unaffected.
- g) Not impede access for emergency or maintenance operation services, unless alternate measures are agreed upon.
- h) Be monitored; follow-up evaluation will be completed to assess effectiveness and the results will be communicated to the community and Council.

**Note:** Traditional traffic calming tools that are deemed inappropriate are listed in Appendix 7. These measures are identified with a description of the lack of success identified in each. These items are not to be considered when implementing physical traffic calming measures.

#### **8.6 Concept Plan Preparation**

Staff will compile a concept plan to be reviewed by stakeholders and the community seeking the traffic calming measures. This concept plan will identify the stakeholders' original concerns with the corridor, summarize the effectiveness of passive measures, and describe the process of scoring the physical traffic calming measures recommended. Staff will review the list of physical calming measures and select the appropriate tool for the identified challenge based on:

1. Landscape
2. Cost
3. Maintenance
4. Emergency access

#### **8.7 Stakeholder Input**

After it has been determined that the requested location meets the initial screening criteria, an open house shall be held to submit the Concept Plan to the proponents of the traffic calming measures. Advertisement for the Open House shall be placed in the local newspaper and on the municipal website. Proponents who attend the Open House will be requested to complete an evaluation of the recommended traffic calming measures.

#### **8.8 Reporting to Council**

Staff shall make presentation to municipal Council providing a summary of the public process, the recommended traffic calming alternative(s) with deliverables, as well as budgetary costing for review.

### **9.0 IMPLEMENTATION**

Upon approval of Council, resident notification, and sufficient funding, traffic calming measures will be implemented. Residents will be notified of implementation timelines through the contact mailing list. Where feasible, staff may decide it is beneficial to phase in the traffic calming plan through the use of temporary or removable traffic calming measures such as pavement markings or barrels. This will allow time to examine the impact of the measures and their effectiveness before committing funding to permanent treatments.

#### **9.1 Final Design Plans**

Staff will prepare engineered drawings for the physical traffic calming measures and review those measures with industry specialists.

#### **9.2 Preparation of Costing**

The installation of physical traffic calming measures may include the use of signage, landscaping, electrical works, concrete and asphalt infrastructure. Staff will endeavour to use current technology that uses lower lifecycle costing, safety, aesthetics, and durability.

### **9.3 Evaluation**

Staff will monitor the installation of the physical traffic calming measures immediately following installation to ensure safety. After initial review, monitoring of the installations shall be tapered to allow the amended traffic movements to mature.

A traffic calming evaluation shall be completed after one (1) year to calibrate the success of the installed measures. Staff will seek input from the proponents, staff, and Police Services to calibrate the success of the installations.

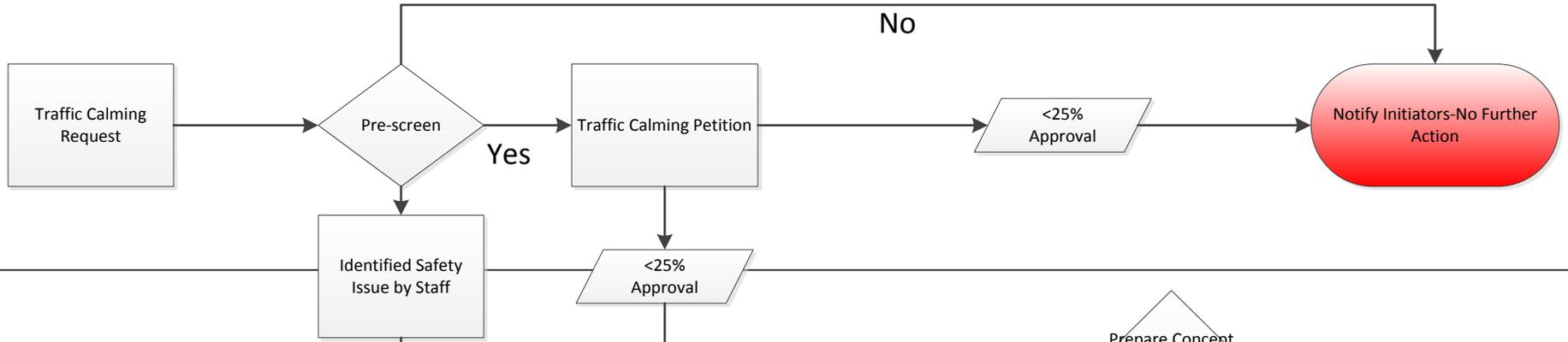
### **10.0 ATTACHMENTS**

- 1.0 Appendix 1 – Traffic Calming Process Flowchart
- 2.0 Appendix 2 – Traffic Calming Request Petition
- 3.0 Appendix 3 – Traffic Calming Request Pre-screening Tool
- 4.0 Appendix 4 – Traffic Calming Scoresheet
- 5.0 Appendix 5 – Passive Traffic Calming Toolbox
- 6.0 Appendix 6 – Physical Traffic Calming Toolbox (Vertical and Horizontal)
- 7.0 Appendix 7 – Inapplicable Traffic Calming Tools

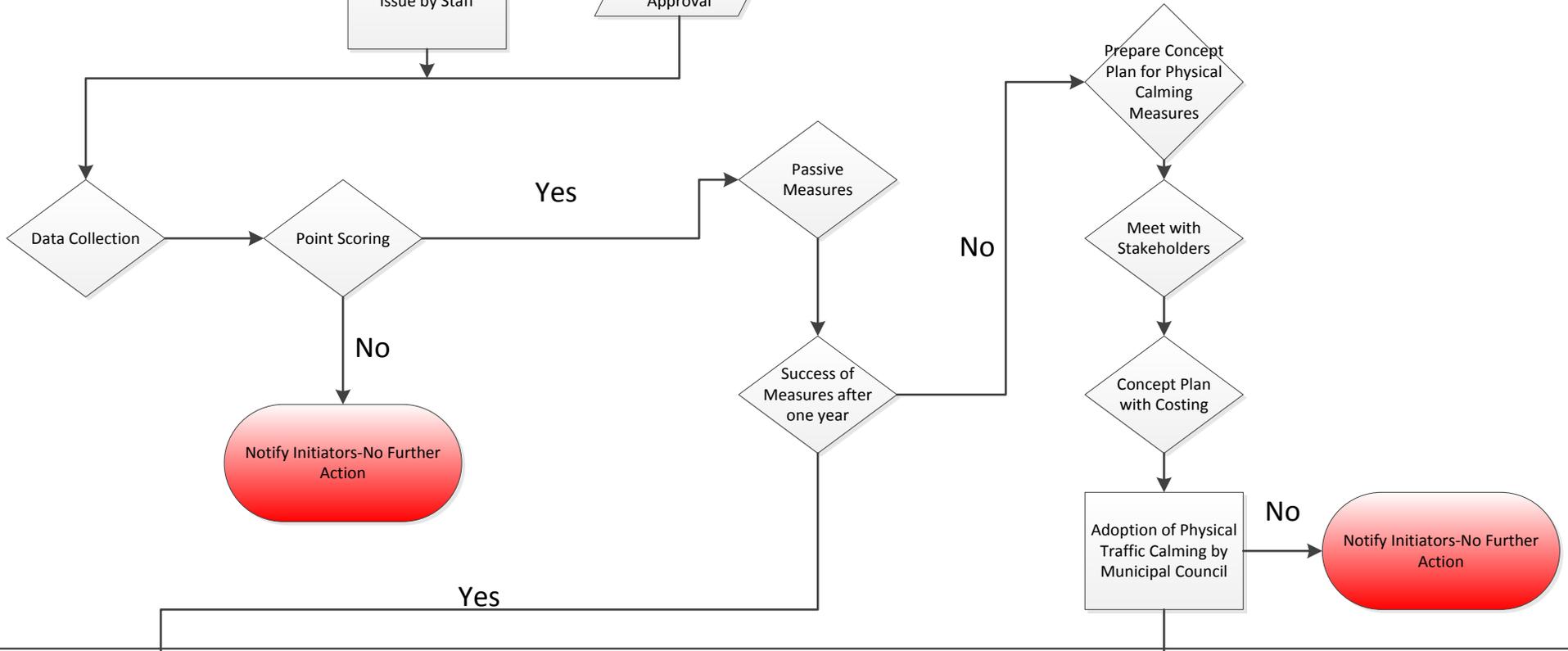
# Appendix 1-Traffic Calming Process Flowchart

Phase

Initiation



Evaluation



Implementation





**THE CORPORATION OF  
THE TOWN OF PERTH**

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## **APPENDIX 2**

**Date:**

### **PETITION LETTER IMPORTANT INFORMATION REGARDING NEIGHBOURHOOD TRAFFIC CALMING REVIEW PETITION**

#### **Please read before signing petition**

The Town of Perth has initiated this petition to evaluate who is interested in initiating a traffic calming review at the following location:

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Perth Staff Note: Insert Street Name and extents (to/from) before sending and attach policy

To initiate a review of whether or not the above-noted street warrants traffic calming, a petition indicating support, is required. The Town of Perth has provided this traffic calming petition and the Town's Traffic Calming Policy to the resident initiating the request for review. The focus of the petition is to determine if there is support from adjacent residents for Town Staff to perform an investigation of traffic concerns on the above-noted roadway.

The results of the petition must show support from at least 25% of the households with direct frontage onto the roadway to be investigated. Each household is represented by one signature, regardless of the number of people in the household (an apartment/condo would count as one household). Failure to meet the 25% support level will result in termination of the investigation. Please note that you should indicate on the petition whether or not you support the request for a review. If you are neutral and do not feel strongly either way, please check off the 'neutral' box: neutral answers will be considered as not supporting the initiation of a review.

Initially, passive measures will be used by the Town for a one (1) year period in an attempt to address the identified operational traffic issues.

If the outcome of the Town's one (1) year review indicates the problem still exists, then physical traffic calming measures are warranted. All affected residents (households), as determined by the Town, will have the opportunity to indicate whether or not they support any future proposed physical traffic calming



## Appendix 3- Traffic Calming Pre-Screening Scoresheet

Street Name: \_\_\_\_\_

Cross Streets: \_\_\_\_\_ to \_\_\_\_\_

Completed By: \_\_\_\_\_

Date: \_\_\_\_\_

**Instruction:** To be completed by municipal staff to determine if a requested street segment qualifies to proceed to the Stakeholder Petition stage of the traffic calming process.

Item	Description	Column 1	Column 2
		Yes	No
1	Is the street segment classified as a local street by the municipality's Official Plan?		
2	Is the Annual Average Daily Traffic greater than 400 vehicles?		
3	Is the 85 <sup>th</sup> percentile speed higher than the posted speed for the street segment?		
4	Is the street segment primarily residential?		
5	Does the street provide an obvious by-pass to a major intersection?		
6	Is the street section longer than 150m?		
7	Does the street section have an exit?		
8	Have any previous traffic calming efforts been made in the past 12 months?		
9	Are there special considerations?		

1. If the street section being reviewed has one (1) or less "No" responses in the scoring system, it may qualify for traffic calming measures.
2. If the street section being reviewed has several (2) "No" responses in the scoring system, it may not qualify for immediate traffic calming measures. The municipality may investigate passive traffic calming measures.
3. If the street section being reviewed has greater than three (>3) "No" responses, the municipality will immediately investigate passive traffic calming measures and activate the subsequent Traffic Calming Policy process.

Proponent(s) of the request will receive notification of the results of the scoring.



**APPENDIX 4**

**TRAFFIC CALMING POINT ASSESSMENT**

**Location:** \_\_\_\_\_ **Date Compiled:** \_\_\_\_\_

**Roadway Type:**  Local  Collector

**Traffic Data**

	<u>Feature</u>	<u>Range</u>	<u>Criteria</u>	<u>Total</u>
1a.	Speed	0 to 35	5 points for every 2 km/hr that the 85th percentile speed is greater than 10 km/hr over the speed limit	
1b.	High Speed	0 to 5	5 points if minimum of 5% of daily traffic exceeds posted speed by 15-20 km/hr	
2.	Volume	0 to 20	Local Roadways: 5 points for every 1,500 ADT Collector Roadways: 5 points for every 2,000 ADT	
3.	Short-Cutting Traffic	0 or 15	5 points if there is a presence of 25% or more short-cutting traffic, additional 5 points for every 10% increment above 25%	
4.	Collisions	0 to 10	1 point for every 2 collisions/year over a 3 year period	

**Road Characteristics**

	<u>Feature</u>	<u>Range</u>	<u>Criteria</u>	<u>Total</u>
5.	Sidewalks	0 or 10	10 points for no sidewalks with evidence of pedestrian activity, 5 points for sidewalks on only one side	
6.	Pedestrian Generators	0 to 15	5 points for each nearby * pedestrian generator such as a school, playground, community centre, libraries, retail centres, etc.	

**Total**

	Does the location meet the minimum requirements			
	<input checked="" type="radio"/> Local roadway = minimum 35 points	<input type="checkbox"/>	Yes	<input type="checkbox"/> No

## Appendix 5- Passive Traffic Calming Tools

Method	Item	Description	Advantage	Disadvantage
<b>Passive and Mitigating Measures</b>	Education	Activities that change people's perceptions and help alter driver behaviour are most preferred. Meetings and workshops with neighbours and the Municipality can help implement and direct traffic calming applications. Most traffic problems are a result of human behaviour. Through outreach programs and Neighbourhood watch programs such as the Active and Safe Routes to School program, residents can play a big part in spreading the information .	Flexible, inexpensive	Measurement challenges, community participation, time commitment
	Controlled Access	One-way traffic movement to reduce traffic flow by allowing movement from one preferred source.	Inexpensive, requires signage, access limitations, education	Requires enforcement and monitoring, Neighbourhood awareness if offenders appear
	Community Entrance Signs	The sign is meant to serve as a reminder for motorists to "turn off" the highway driving mode and to be aware that they are entering a residential area where reduced speeds are required to negotiate vehicles entering and exiting driveways as well as the potential for children to be playing adjacent to the roadway.	Community commitment	Visual clutter, expensive, maintenance
	Textured Pavement	Textured pavement and stamped asphalt can be used alone as a traffic calming measure or in combination with other physical measures. Drivers typically slow down when crossing textured pavement due to vibration created by the pavement surface. However, this also creates considerable noise that may be a disadvantage for neighbours.	Visually unique	Generates noise, expensive, limited effectiveness
	Targeted Speed Limit Enforcement	Targeted speed limit enforcement in response to identified operational issues can be requested. Targeted speed limit enforcement purpose is to make drivers more aware of their speed within a residential area. This measure typically only provides a temporary benefit, since speed limit enforcement is not available on a regular, on-going basis.	Limited preparation, no emergency/maintenance vehicle limitations,	Temporary, fines lower than operating costs, time constraints
	Speed Display	A dynamic speed display sign performs the same function as a radar trailer, but is meant to be installed as a permanent device. Real-time speeds are relayed to drivers and flash when vehicle speeds exceed the posted speed limit. Dynamic speed display signs are typically placed in on a street for a period of 1 week.	Limited preparation, no emergency/ maintenance vehicle limitations	One direction only, temporary, subject to vandalism
	On Street Parking	Streets in residential areas can be built wide enough to allow on street parking on at least one side of the road. Area residents often create the opportunity to speed by introducing No Parking zones. Eliminating parked vehicles from your street significantly increases the width of the road and will increase the speed of local traffic.	Not limiting emergency vehicles, low risk, low maintenance cost	Higher cost of road construction

**Appendix 6-Applicable Traffic Calming Tools**

Method	Item	Description	Advantage	Disadvantage
<b>Traffic Calming Methods- Horizontal Deflection</b>	Curb Extension	Curb extensions reduce the roadway width at intersections and midblock locations, thereby reducing speeds when drivers experience the physical perception of a narrow roadway. Curb extensions offer the more important benefit of improving pedestrian safety by providing a refuge and shortening the crossing distance .	Effective in school zones, increase pedestrian safety, reduce parking issues, landscaping	Vehicle movement limitations, cycling lane shift, maintenance issues
	Curb Radius Reduction	The Curb radius reduction is the reconstruction of an intersection corner to a smaller radius. This measure effectively slows down right-turning vehicle speeds by making the corner 'tighter' with a smaller radius. A corner radius reduction may also improve pedestrian safety to a certain degree by shortening the crossing distance. This type of measure is acceptable primarily on local roads and to a lesser extent on collector roadways, its use is often limited to specific situations where the existing intersection geometry would allow the reconstruction. In addition, curb radius reductions should not be used on transit routes requiring a right turn.	Shorter pedestrian crossing duration, stresses long stops by vehicles	Turning movement challenges by larger vehicles, infrastructure damages
	Center Island Median	Center island medians are raised islands located along the centerline of a street that narrow the travel lanes at that location. The presence of a median, resulting in a smaller roadway width, reduces speeds when drivers experience the physical perception of a narrow roadway. The medians can be landscaped to provide visual amenity.The median island can act as a "gateway" when placed at the entrance to a neighbourhood. A median island of adequate width can also be referred to as a "pedestrian refuge" if located at a crosswalk and the median is accommodating for pedestrians.	Perception of lower speed to drivers, landscaping area	Limiting to driveway accesses
	Lateral Shift	Lateral shifts can be described as one half of a chicane. Curb extensions or pavement markings are provided on otherwise straight streets that cause travel lanes to bend one way and then bend back the other way to the original direction of travel. With the appropriate degree of deflection, lateral shifts are one of the few measures that have been used on collectors or even arterials. When high traffic volumes and high posted speed limits prevent the use of other traffic calming measures, lateral shifts can be considered .	Higher traffic volumes, discourages higher speeds, negotiable by emergency/maintenance equipment,	Can cause inadvertent vehicle interaction, curb alignment expensive
	Curb Face Sidewalk	A curb face sidewalk is a wider than normal sidewalk retrofitted into an older area of the municipality where putting a sidewalk in standard location would eliminate or damage a number of mature trees. The sidewalk is primarily built on the existing road bed, narrowing the road.	Can be added to an existing corridor.	Could expose pedestrians to vehicle impacts such as vehicle draft and splashing on corridors with drainage challenges.

**Appendix 6-Applicable Traffic Calming Tools**

Method	Item	Description	Advantage	Disadvantage
<b>Traffic Calming Techniques- Vertical Deflection</b>	Speed Cushion	Speed cushions are narrower speed humps that are typically installed in the center of each travel lane. Speed cushions typically are six (6) feet in width. Speed cushions typically range in length between seven (7) and ten (10) feet. Passenger vehicles will traverse the speed cushions in the same manner as a speed hump. However, emergency vehicles are able to straddle the speed cushions due to their wider wheel track . Thus, response times for emergency vehicles are not increased as much (if at all).	Lower Cost, low impact to emergency services and maintenance	Increased noise, larger vehicle straddle, damage by snow equipment
	Raised Intersection	Raised intersections can be used as a traffic calming measure while also alerting drivers to the potential for pedestrians or vehicles at an intersection. The physical attributes are similar to a speed table in that each intersection approach elevates to a height of three (3) inches over a length of six (6) feet. The flat top, also similar to a speed table, is provided throughout the entire intersection.	Visible pedestrian crossing, preferred over speed humps, can improve aesthetics (texture)	Expensive, noise pollution, drainage challenges, damaged by winter equipment
	Raised Crosswalk	Raised crosswalks have a similar shape to a speed table, but the flat top contains a striped pedestrian crosswalk. These measures should be elevated to a height that matches the adjacent sidewalk, such that the raised crosswalk is flush with the curb or top of sidewalk elevation at each end. Raised crosswalks must be installed with the appropriate sidewalk transitions on both sides.	Visible for pedestrian crossing, aesthetics improvement, less limiting than speed humps, less expensive than raised intersections,	Expensive, noise pollution, drainage challenges, damaged by winter equipment
	Speed Table	Speed tables are flat-topped speed humps. Speed tables typically measure between three (3) and four ((4) inches in height and 22 feet in length, with the flat portion being ten (10) feet in length. Speed tables are typically long enough for the entire wheelbase of a passenger car to rest on the flat top. Their long flat fields give speed tables higher design speeds than speed humps.	Less impact to emergency vehicles, effective, aesthetics	More expensive than speed humps, noise pollution, winter maintenance increase, drainage
	Speed Hump	Speed humps are raised areas of pavement which are rounded on top and placed cross the entire street. Speed humps typically measure between 75 and 100 millimeters in height and 10m in length. The height and length of the speed hump determines how fast it can be navigated without causing discomfort to the driver. Discomfort increases as the speed of the vehicle traveling over the hump increases.	Low cost, effective	Drainage challenges, damaged by winter maintenance, vehicle damage, emergency/winter vehicle effectiveness reduction

## Appendix 7 - Inapplicable Traffic Calming Tools

Item	Description
Unwarranted All-Way Stop	Driver frustration- Limited impact zone (100m)
	Poor compliance with stop signs due to driver frustration
	Results in more frequent rear-end collisions caused by low percentage of motorists who actually do come to a complete stop.
	Requires frequent police enforcement as motorists do not stop, a drain on manpower resource.
	Potential risk to pedestrians especially children and seniors crossing an intersection, since not all motorists approaching an intersection will stop.
20/30/40 km/hr Speed Zone	People travel at a speed they feel comfortable based on the environment though which they are driving regardless of the posted speed limit.
	Compliance with an artificially reduced speed is only achieved with consistent and visible police enforcement
	Collisions, when they occur, can be more significant due to the differences in speed between vehicles.
	Pedestrians may perceive the roadway to be safer due to the reduced speed limit. This false sense of security may lead pedestrians that are crossing the roadway to not be as cautious as they would be otherwise.
'Children at Play' Sign	Warning signs can be effective tools if used sparingly and only to warn motorists of uncommon hazards that are not apparent to motorists.
	Children at Play' signs can give parents a false sense of security since motorists often disregard these signs.
	Children playing in the streets, while common place, is dangerous and prohibited in the Highway Traffic Act
	Since children live on nearly every residential block, 'Children at Play' signs would need to be placed on every roadway.
	Residential blocks with no signs might imply that no children live there, so it is acceptable to exceed the posted speed limit.
Speed Limit Sign	The posted speed limits for roadways are typically established based upon recognized engineering criteria related to the roadway design.
	Posted speed limits, which do not match the characteristics of the roadway frustrate motorists and tend to foster aggressive driving habits.
	Posted speed limits should be implemented in a consistent manner so that the speed limits maintain a level of credibility and compliance when the posted speed limit is applied properly. Reduced speed limits seem to provide the greatest result in situations when they are self-enforcing
	Additional signage for the posted speed limit of a roadway are not considered to be traffic calming measures.
Rumble Strip	Used for unattentive drivers on highways, create a noise annoyance in a residential area
	Used to indicate potential hazard ahead
Speed Bumps	Potential risk of vehicle damage
	Necessary, sudden braking may cause rear-end collisions