

Town of Ajax

Traffic Calming Warrant Update Final Report

March 2015

B000468



Town of Ajax

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Warrant Update**
Final Report

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Executive Summary

CIMA was retained by the Town of Ajax to update the Town's Traffic Calming Warrant process, adapting it to better address the increase in public inquiries received by the Town regarding traffic infiltration, volumes, collision frequency and excessive speeds. The updated process is expected to provide a more appropriate, efficient and flexible framework to address traffic calming requests.

The Town of Ajax Traffic Calming Warrant process update included several steps to ensure that the end result would be both consistent with the practices of other municipalities, and adequate to address the Town's particularities. This was accomplished by means of a Best Practices Research conducted with other municipalities in Ontario and across Canada; Public and Stakeholder Consultations, to inform residents and provide an opportunity to submit ideas, comments and concerns, and to gather feedback from Ajax Fire and Emergency Services, Durham Region EMS, and Durham Region Transit Commission regarding the Toolbox of Traffic Calming Measures; and Pilot Testing conducted with previous requests to ensure the adequacy of the updated screening and scoring system.

The basic structure of the warrant process is similar to the previous version, including the following six steps: Request for Traffic Calming; Screening Process; Evaluation; Available Traffic Calming Measures; Council Approval for Capital Budget; and Design, Approval and Implementation. The main modifications to the process are the following:

+ Lists of Eligible Locations:

- Creation of two separate lists of eligible locations: General List and Priority List;
- Elimination of a ranking based on scores;
- Prioritization of projects based on date of request;

+ Screening Process:

- Inclusion of Block Length as a screening criterion;
- Removal of traffic volumes and non-local traffic as screening criteria;
- Increased flexibility to recommend an approach other than traffic calming based on engineering judgement;
- Prioritization of locations with extremely high operating speeds (Priority List);

+ Scoring Process:

- Removal of Non-Local Traffic, Emergency Services, Transit and Truck Routes;
- Inclusion of Percentage of High-End Speeders;

+ Public and Stakeholder Input:

- Simplified procedure for public and stakeholder input;

The Toolbox of available traffic calming measures was expanded based on available literature and on results from a jurisdictional review conducted by CIMA. In addition to the applicability of each measure to different types of roads, present in the previous version, the new Toolbox also presents

potential benefits and disbenefits as well as general costs in a qualitative format. This should provide Town staff with a comprehensive set of criteria to select the most appropriate measure to address the needs of each specific project.

Finally, the automatic spreadsheet tool was updated to include the changes to the warrant process, and database functionality was added for Town staff's convenience.



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1. Introduction

The Town of Ajax (the Town) receives numerous public inquiries each year regarding traffic, especially traffic calming requests. Since the implementation of the original Traffic Calming Warrant Framework and Process in November 2007 (2007TCW) the Town has experienced a population increase by approximately 39% to 125,000 in 2014. This corresponds with an increase in public inquiries received by the Town regarding traffic infiltration, volumes, collision frequency and excessive speeds. Further, a 2014 Resident Survey by the Environics Research Group indicates that transportation is the most important social issue facing Ajax. Therefore, there is a need to review and update the 2007TCW to provide a more appropriate, efficient and flexible framework to address traffic calming requests.

1.1 Study Background and Objectives

Since the implementation of the Town's traffic calming process in 2007, Town staff has identified some opportunities for improvements to make the process more efficient and fair. Some of these opportunities included:

- + Refine the screening and scoring process to allow the Town to focus its resources on locations experiencing highly undesirable conditions;
- + The previous warrant worked with a scoring and ranking system. This could result in lower-scoring requests being indefinitely ranked at the bottom of the list as newer, higher-scoring requests would take priority over them, therefore never having any traffic calming measures implemented;
- + The previous warrant included two cumbersome phases requiring public support for each individual project. This made the process slow and costly with many projects stalling prior to the implementation stage;
- + The previous warrant did not take into account high end speeders at locations where 85th percentile speeds might not be excessive. Depending on traffic volumes, this may be a considerable safety concern even if the majority of speeds are relatively low;
- + The previous warrant did not account for the possibility of traffic calming not being the best strategy to address a request based on existing conditions; and
- + The update and enhancement of the list of approved measures and devices (Toolbox of Traffic Calming Measures) available for use in the Town. This involves the provision of a general evaluation framework for each measure in terms of benefits, disbenefits and costs.

The objectives of the warrant update were to address the opportunities for improvements listed above, and to incorporate other modifications that reflect current industry practices. In order to accomplish this, the study included the following major tasks:

- + Review and assessment of existing warrant;
- + Best Practices research;
- + Proposed warrant updates;

- + Public and stakeholder consultation;
- + Pilot testing of proposed updates; and
- + Final warrant document.

1.2 Report Overview

This report updates the previous Town's traffic calming warrant process from November 2007, incorporating findings from a Best Practices research (summarized in **Appendix A**) conducted with other municipalities in Ontario and across Canada. A literature review was also conducted with the purpose of updating the Toolbox of traffic calming measures.

The warrant methodology consists of six steps, two of which can be considered its core: *screening* and *scoring*. **Section 2** describes the warrant methodology in detail, covering all aspects of the traffic calming process from initial request to final approval and implementation.

Section 3 summarizes the results of a pilot study conducted to assess the adequacy of the screening and scoring criteria.

Finally, CIMA has developed an updated version of the automatic spreadsheet used to assist the Town in the screening and scoring process. **Section 4** discusses the updated version of the automatic spreadsheet.

A vital aspect of a successful traffic calming program is public involvement. As such, a Public Information Centre (PIC) held in the Town of Ajax Council Chambers on January 21, 2015. This PIC sought to inform residents as well as provide an opportunity to submit ideas, comments and concerns to the Project Team. Details of this PIC and the materials presented can be found in **Appendix B**.

In order to ensure the continued cooperation between a variety of stakeholders (i.e. Ajax Fire and Emergency Services, Durham Region EMS, and Durham Region Transit Commission), the Town held a meeting in the Simcoe Point room at the Ajax Town Hall on February 13, 2015. This meeting strived to inform the stakeholders with a high-level understanding of the warrant update while providing an opportunity to submit feedback regarding the Toolbox of Traffic Calming Measures. Further information regarding this meeting and the materials presented can be found in **Appendix B**.

While this report does discuss some of the reasoning for changes made to the 2007TCW, it primarily focuses on the end results that encompass the new traffic calming warrant process. Additional details of the warrant update process, particularly discussions between CIMA and Town staff following the Best Practices Research and preceding the Pilot Testing, are provided in **Appendix A**.

A list of acronyms, 'technical' jargon or otherwise ambiguous terms used in this report can be found in **Appendix F**.

2. Methodology

The following sections describe a six-step process for the implementation of traffic calming measures on Town roads, beginning with a request for traffic calming and ending with design, approval and



implementation. **Exhibit 1** contains a flowchart of the entire process (a larger version can be found in **Appendix C**), and the relevant sections of the flowchart are included within each step in the following subsections.

From initial request to final approval, the traffic calming warrant process consists of six steps and has three possible outcomes:

- + The request is denied;
- + The request is added to the General List; or
- + The request is added to the Priority List.

If a request is denied, the applicants and affected residents are notified, and the road is prohibited for traffic calming consideration for a period of three years beginning at the date of their assessment.¹ The General List contains locations that passed the screening process and achieved the **Threshold Score** in the evaluation scoring. The Priority List contains locations that passed the screening process with 85th percentile speeds equal to or greater than the **Critical Speed**.

The selection process for future projects should equally involve locations from the Priority and General Lists in accordance with budgetary requirements. In the event that an odd number of projects is required, selecting an additional location from the Priority List is desirable. The selection should be based on the chronological order of the requests – i.e. older requests should be implemented first. Locations are no longer ranked based on the scores. With the previous systems, locations that met the warrant with lower scores could potentially never be selected for implementation, since newer requests with higher scores would take precedence. The new system ensures that all warranted locations may eventually receive traffic calming measure, while still maintaining some differentiation based on technical criteria with the creation of the priority list.

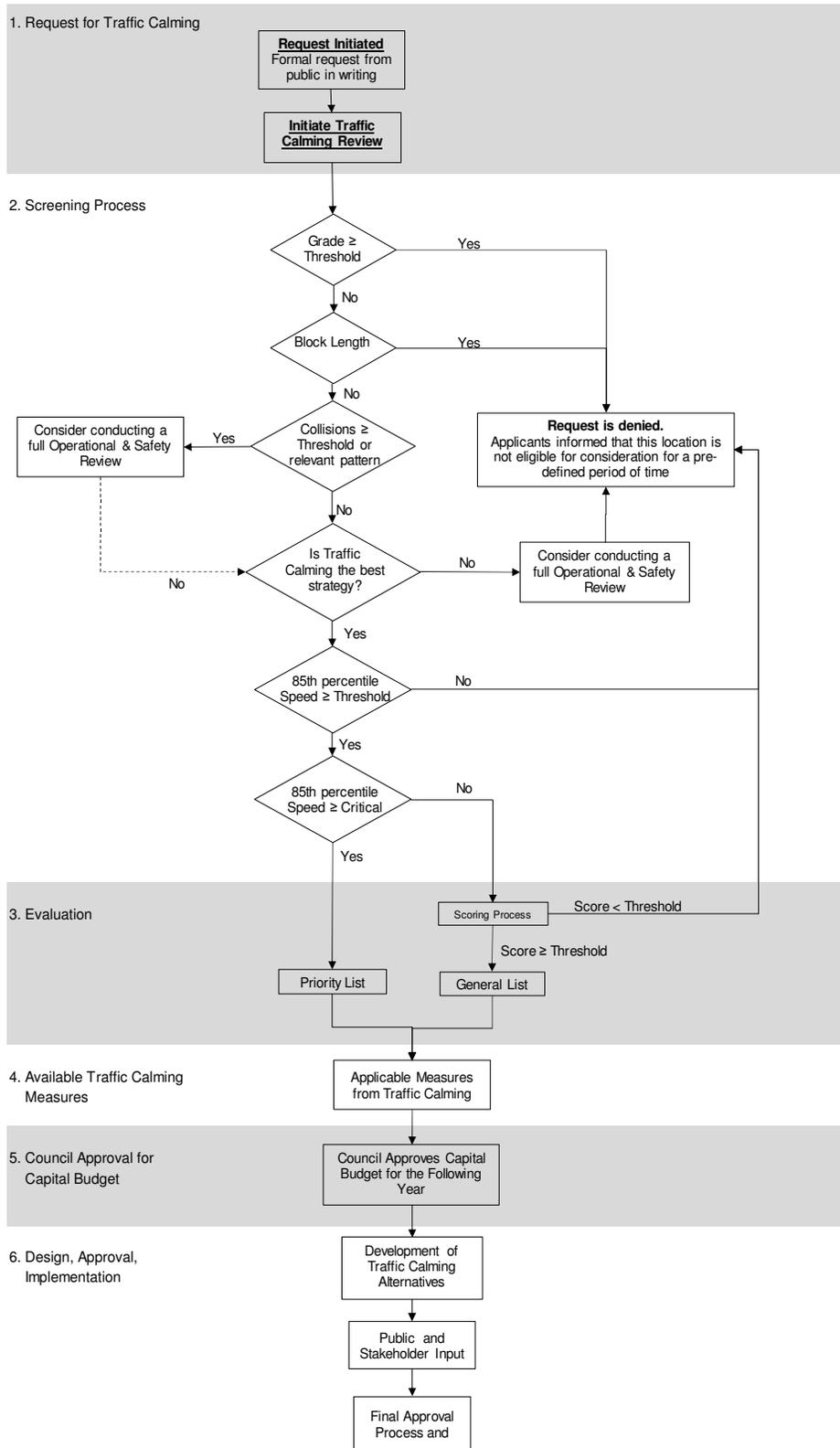
The following subsections contain details about each of the steps in the traffic calming warrant process.

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¹ Every location which received a request for traffic calming, from 2012 onwards, was re-evaluated using the new criteria. The period of ineligibility for those requests which were subsequently denied begins from the date of the Traffic Calming Warrant Update's approval by Council.



Exhibit 1: Town of Ajax Traffic Calming Warrant Process



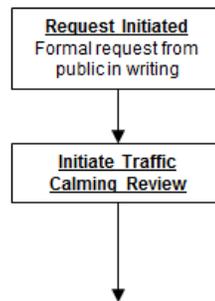
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2.1 Step 1: Request for Traffic Calming

Requests for traffic calming typically come from Town residents, business owners, schools or members of Council. Identification of potential locations may also come from ongoing staff reviews. Planning and Development Services staff are responsible for the review of all requests.

Exhibit 2 describes the request process. In the case of a request from the public, a formal request in writing is required. Town staff would then initiate a Traffic Review, described in **Section 2.2**.

Exhibit 2: Step 1: Request for Traffic Calming



2.2 Step 2: Traffic Calming Screening Process

The next step in the process is an initial screening process undertaken by Town staff. The screening process sets requirements that must be met for a location to be eligible to be evaluated using the scoring system. The screening process can be summarized as follows:

- + **Grade:** if the grade of the roadway is equal to or greater than the **maximum threshold of 8%**, then traffic calming is not permitted on the roadway at all. This is consistent with other jurisdictions and is due to the fact that traffic calming devices implemented on steep grades could cause safety concerns.
- + **Block Length:** if the distance between stop-controlled intersections along the requested route (intersections with stop control only on the side street are not considered) is **shorter than 110 m**, traffic calming is not permitted. One of the main goals of traffic calming is to reduce speeds by using physical interventions to influence driver behavior. At locations where, for example, the distance between two adjacent stop-controlled intersections is too short, drivers may not have sufficient space to develop high speeds before having to slow down again for the next stop sign (i.e. a minimum amount of space is required to build up speed to contribute to a problem). This is consistent with other jurisdictions practices.
- + **Collision History:** if the number of qualifying collisions within the past three years is equal to or greater than the maximum threshold, or if a relevant pattern of collisions is identified, the location should be **considered for a full Operations and Safety Review**. The collision history thresholds are the same as in the previous version of the warrant (6 for Local roads; 12 for Collector and Type 'C' Arterial roads), however collisions alone do not directly qualify locations for the scoring process as it was before. Instead, the threshold is used to suggest that consideration be given to conducting a full Operations and Safety Review. Typical numbers of qualifying collisions in past

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request range between 0 and 4, meaning that the collision threshold is expected to be reached on rare occasions. A collision frequency significantly higher than the typical may indicate that the location could present other collision contributing factors. The definitions of *qualifying collisions* and *relevant pattern*, for the purposes of the traffic calming warrant, are the following:

- *Qualifying collisions* are those that can be potentially corrected by traffic calming, and include collisions with **vulnerable road users** (pedestrians, bicycles) and collisions for which ‘**exceeding speed limit**’ or ‘**speed too fast for condition**’² is reported in the MVAR.
 - *Relevant pattern* means a clear pattern of reoccurring collisions where speed is not a factor. These are not restricted to qualifying collisions as defined above, and may include, for example, intersection-related collisions, winter condition related collisions, etc.
- + **Best Strategy:** if, based on existing conditions, **traffic calming is not the best strategy** to address the request, the subject location is not eligible for traffic calming. Examples of existing conditions for which traffic calming may not be the best strategy include:
- Where the location presents a sequence of small-radius curves;
 - Where the location presents visibility restrictions;
 - Where similar locations would typically not receive traffic calming;
 - Where arterial network improvements could reduce cut-through traffic and volumes, potentially solving the concern that originated the request.

Additional conditions may also be considered incompatible with traffic calming measures based on engineering judgement.

- + **Operating Speeds:** if the 85th percentile speed is **equal to or greater than the Critical Speed**, the location is added directly to the Priority List; if the 85th percentile speed falls **between the Critical and the Minimum Threshold speeds**, the location proceeds to the scoring process; if the 85th percentile speed is **less than the Minimum Threshold Speed** the location is not eligible for Traffic Calming. The Minimum Threshold Speed is defined as 10 km/h above the posted speed limit; the Critical Speed varies by road classification, as follows:
- 15 km/h above the posted speed limit for Local roads;
 - 20 km/h above the posted speed limit for Collector roads; and
 - 25 km/h above the posted speed limit for Type ‘C’ Arterial roads.

Exhibit 3 summarizes the screening criteria and associated thresholds, and **Exhibit 4** graphically represents the screening process.

² For collisions where ‘*speed too fast for condition*’ is indicated, the analyst should use their best judgement based on the police officer’s description of the collision to determine whether it could have been prevented by traffic calming. This would not be the case if, for example, the condition referred to were exclusively weather related.



Exhibit 3: Criteria and Thresholds

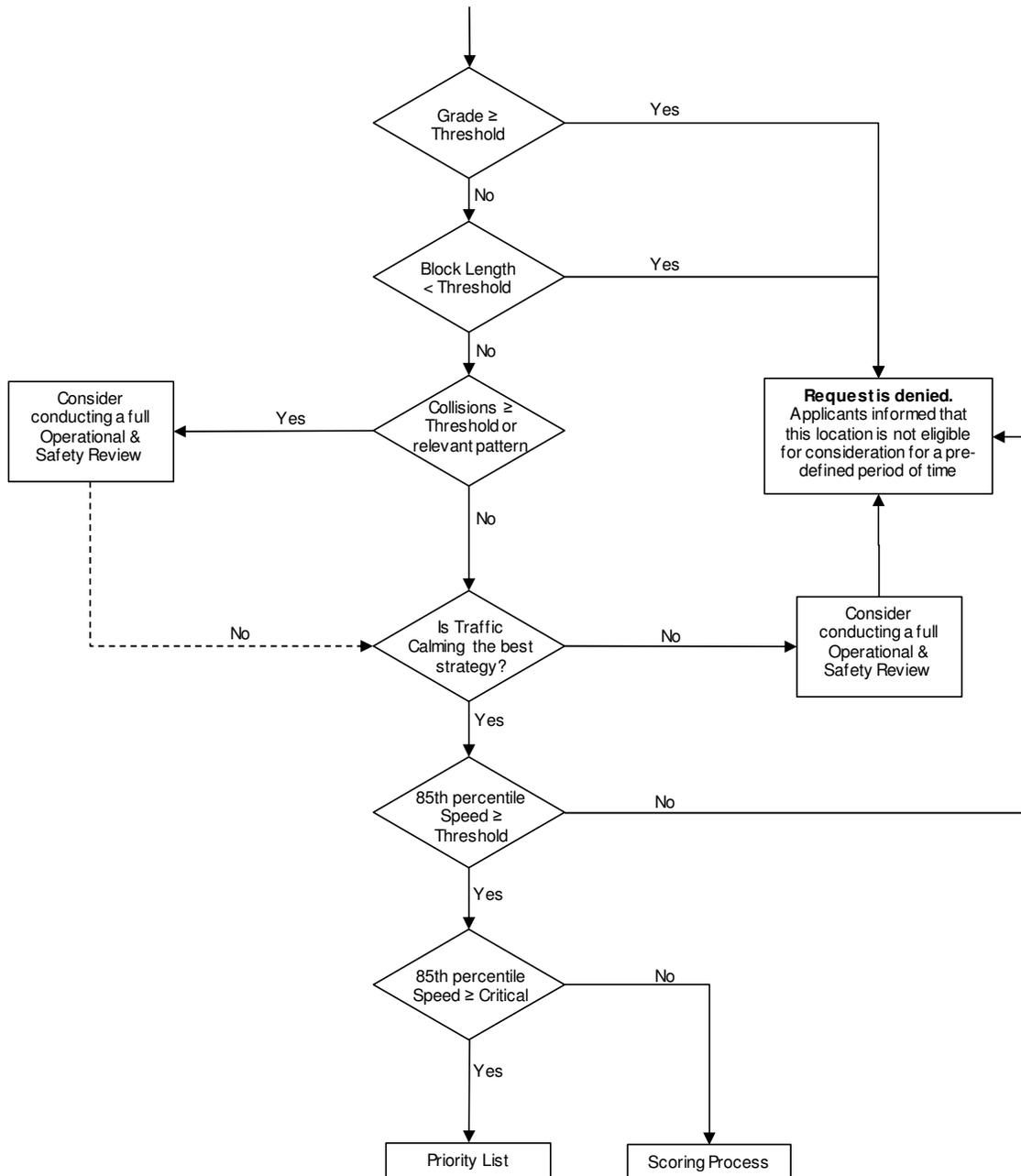
Criteria	Threshold		Notes
	Local Road	Collector / Type C Arterial ³	
Grade		< 8%	If the grade is equal to or greater than 8%, traffic calming is not permitted
Block Length		≥ 110 m	If the distance between stop-controlled intersections along the requested route (disregard stop control only on side streets) is shorter than 110 m, traffic calming is not permitted
Collision History	< 6	< 12 or Relevant pattern identified	If the number of qualifying collisions within the last three years is equal to or higher than the threshold, or if a relevant collision pattern can be identified, an alternative approach (for example, full operational and safety reviews) should be considered
Is traffic calming the best strategy for the location?		Yes	If traffic calming is not the best strategy to address the request, based on existing conditions, an alternative approach (for example, full operational and safety reviews) should be considered
Operating Speeds	≥ Minimum Threshold Speed & < Critical Speed		If the 85th speed is equal to or higher than the Minimum Threshold Speed (10 km/h above the posted speed limit), but lower than the Critical Speed, the location proceeds to the scoring evaluation
Operating Speeds	≥ Critical Speed		If the 85th speed is equal to or higher than the Critical Speed (15, 20 or 25 km/h above the posted speed limit, depending on the road classification), the location is added to the Priority List

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³ While arterial roads are not ideal candidates for traffic calming, some of Town of Ajax's *Type 'C' Arterials* effectively function as collectors.



Exhibit 4: Step 2: Screening Process



2.3 Step 3: Evaluation Scoring

Requests that pass the initial screening and that are not directly added to the Priority List are evaluated based on 7 criteria established by the Town of Ajax. Each location evaluated receives a number of points for each of the criteria, as shown in **Exhibit 5** and **Exhibit 6**, and the total number of points (Score) determines whether the location will be added to the General List or the request will



be denied. The minimum thresholds to add a location to the General List, for each road classification, are:

- + 30 points for Local roads;
- + 45 points for Collector roads; and
- + 50 points for Type 'C' Arterial roads.

Therefore, any location that does not obtain its minimum score based on its classification is ineligible for traffic calming.

The minimum scores were determined through pilot testing, further discussed in **Section 3**. Town staff may conduct periodic assessments and adjustments to the scoring system to better represent changing speed or volume patterns.

Exhibit 5: Step 3: Points System for Local Roads

FACTOR	POINT CRITERIA	MAXIMUM POINTS
Collision History	5 points for each qualifying collisions in excess of 3	20
Traffic Speeds	1 point for each km/h above posted speed, and 1 point for each 1% of vehicles over 15 km/h above posted speed	25
Traffic Volumes	1 point for each 50 vehicles above threshold	20
Pedestrian Generators	5 points for each school or park within the study area (other Pedestrian Generators may be defined by Ajax)	n/a
Pedestrian Facilities	5 points if there are no sidewalks in the study area	5
Bicycle Facilities or Routes	5 points if bicycle lanes, sharrows, or routes are present in the study area	5
Adjacent Land Uses (residential)	1 point for each 20% of residential land use	5

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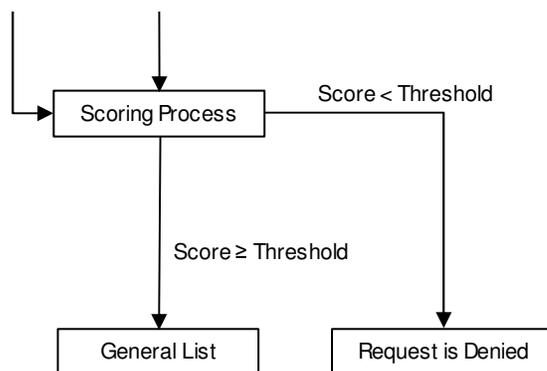
Exhibit 6: Step 3: Points System for Collector and Type 'C' Arterial Roads

FACTOR	POINT CRITERIA	MAXIMUM POINTS
Collision History	5 points for each qualifying collisions in excess of 3	15
Traffic Speeds	1 point for each km/h above posted speed, and 1 point for each 1% of vehicles over 15 km/h above posted speed	25
Traffic Volumes	1 point for each 100 vehicles above threshold	20
Pedestrian Generators	5 points for each school or park within the study area (other Pedestrian Generators may be defined by Ajax)	n/a
Pedestrian Facilities	10 points if there are no sidewalks in the study area 5 points if only on one side	10
Bicycle Facilities or Routes	5 points if bicycle lanes, sharrows, or routes are present in the study area	5
Adjacent Land Uses (residential)	1 point for each 20% of residential land use	5

The traffic volumes used in the warrant are two-way average daily traffic, recorded over a 24-hour period, and their thresholds are:

- + 900 vehicles/day for Local roads;
- + 2,000 vehicles/day for Collector roads; and
- + 5,000 vehicles/day for Type 'C' Arterial roads.

Exhibit 7: Step 3: Evaluation Scoring



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2.4 Step 4: Available Traffic Calming Measures

The list of available traffic calming measures (Toolbox) from the previous version of the warrant was reviewed and expanded based on available literature, including the *Canadian Guide to Neighbourhood Traffic Calming* (TAC, 1998), the *Traffic Calming: State of the Practice Report* (ITE/FHWA, 1999), as well as results from a jurisdictional scan conducted by CIMA for previous projects. Further to the inclusion of additional traffic calming measures, the new Toolbox presents potential benefits, potential disbenefits and costs in a qualitative format – the previous version contained only the applicability of each measure to different types of roads.

The Town's Fire Department and the Region of Durham's Transit and Emergency Medical Services (EMS) representatives were invited to provide comments regarding the proposed Toolbox. The Fire Department provided their perceived level of disbenefits for each of the traffic calming measures, and the information was added to the final version of the Toolbox. Transit and EMS did not provide additional comments.

In the new process, Town staff will continue to take the input of Emergency Services into account when developing a traffic calming plan, using careful engineering judgment when selecting a traffic calming measure.

The new Toolbox maintains its use of Vertical Deflection, Horizontal Deflection and Obstruction types of traffic calming measures. Traffic Calming measures added to the updated Toolbox include:

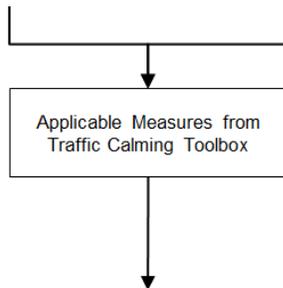
- + Vertical Deflection:
 - Rumble Strip;
 - Speed Table;
 - Textured pavement; and
 - Textured crosswalk;
- + Horizontal Deflection:
 - Chicane, 2-Lane;
 - Lateral Shift;
 - Neckdown;
 - Lane Narrowing; and
 - Road Diet.

Signage measures were removed because of their minimal effects on speed reduction. Furthermore, unwarranted signs such as stop signs can create adverse effects such as an increased frequency of rear-end collisions and a decrease in driver compliance. Signage should only be used as a complement to, or warning for, other traffic calming measures.

The new Toolbox of traffic calming measures is included in **Appendix D**.

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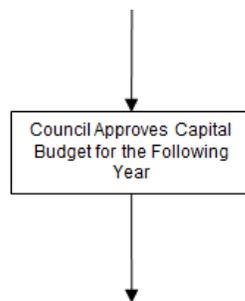
Exhibit 8: Step 4: Available Traffic Calming Measures



2.5 Step 5: Council Approval for Capital Budget

In this step, Town staff would prepare preliminary estimates for the requests at the top of each list (General and Priority) and forward the following year's recommended project(s) to Council for approval, in full awareness of the allotted Traffic Calming budget. If there are no projects in the Priority List in a specific year, projects wholly selected from the General List are forwarded for Council approval.

Exhibit 9: Step 5: Council Approval for Capital Budget



2.6 Step 6: Design, Approval, Implementation

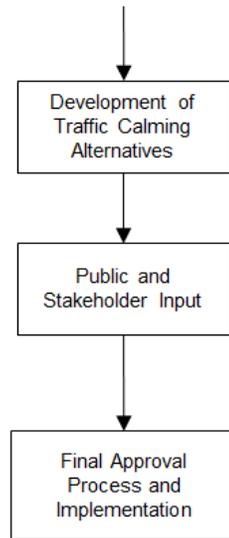
Exhibit 10 shows the final step of design, approval and implementation.

Once Council approves the projects in principle and the budget is established, Town staff ascertains the need for professional consultation. Preliminary designs shall be carefully developed based on the Toolbox of traffic calming measures and with special consideration to impacts on Emergency Services.

The alternatives are then presented through a dual stage public consultation process. Stage one introduces the public to the preliminary design alternatives and provides the public the opportunity to be directly engaged with the Project Team at the critical juncture of the process. The feedback received at this stage will be considered for incorporation into the alternative designs. A second stage will present the public with the final design of the project.

After incorporating the public and stakeholder input into the alternatives, Town staff shall select the most appropriate option and proceed to final design. The plan is then submitted to council for final approval, after which the process of tendering, implementing and evaluating the plan commences.

Exhibit 10: Step 6: Design, Approval, Implementation



3. Pilot Testing

A pilot test was conducted with four locations selected by Town Staff. The four locations were reviewed and the warrant process was followed in order to:

- + Verify or refine the thresholds such as percentage of high-end speeders, Critical Speed and number of points warranting inclusion in the General List; and
- + Confirm the adequacy of the number of points provided in each of the scoring system criteria.

In order to maximize exposure to the warrant process, two of the locations were assessed by CIMA and two were assessed by Town staff. The locations reviewed were:

- + Pearce Drive between Delaney Drive and Coughlen Street (CIMA);
- + Rands Road between Finley Avenue and Westney Road (CIMA);
- + Williamson Drive between Thackery Drive and Salem Road North (Town staff); and
- + Elizabeth Street between Kearney Drive and Old Kingston Road (Town staff).

Previous warrant analyses conducted by the Town at these four locations are summarized in **Exhibit 11**.

Exhibit 11: Locations Assessed in the Pilot Study

Road Section	Class	Posted Speed	85th %ile Speed	Volume	Collisions	Previously Eligible
Rands Road [Finley Ave – Westney Rd]	Local	40	49	2448	2	Yes
Pearce Drive Pearce Drive [Delaney Dr – Coughlen St]	Collector	40	47	1501	1	No

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Road Section	Class	Posted Speed	85th %ile Speed	Volume	Collisions	Previously Eligible
Williamson Drive [Thackery Dr – Salem Rd N]	Arterial	40	52	1934	1	No
Elizabeth Street [Kearney Dr – Old Kingston Rd]	Arterial	40	54	7199	0	Yes

Additional analysis was conducted by Town staff to further refine both screening and scoring criteria. This analysis included thirty-six locations. Further details about both pilot tests can be found in **Appendix E**.

4. Traffic Calming Warrant Spreadsheet Tool

As part of this assignment, CIMA updated the existing spreadsheets used by the Town of Ajax in the traffic calming warrant process. The tool consists of an analysis worksheet and a summary report table.

4.1 Traffic Calming Warrant Analysis Worksheet

The Traffic Calming Warrant Analysis Worksheet is designed to aid Town staff in determining if a site is eligible for traffic calming, and in which list (General or Priority) a location should be included. The worksheet is divided into four sections, as shown in **Exhibit 12**.

Exhibit 12: Traffic Calming Warrant Analysis Worksheet



**Town of Ajax
 Planning and Development Services
 Traffic Calming Warrant Analysis Worksheet**

Clear Worksheet

Save to Database

Go to Database

1. Location:

Date of Request:

Requested By:

Description of Complaint:

Analyst:

Date of Analysis:

Preliminary Screening

Criteria	Value	Result
Posted Speed (km/h)	<input type="text"/>	<input type="text"/>
Road Type	<input type="text"/>	<input type="text"/>
Grade (%)	<input type="text"/>	<input type="text"/>
Block Length (m)	<input type="text"/>	<input type="text"/>
Collision History	<input type="text"/>	<input type="text"/>
Collision Pattern Identified?	<input type="text"/>	<input type="text"/>
Full Operational/Safety Review?	<input type="text"/>	<input type="text"/>
Is Traffic Calming the Best Strategy?	<input type="text"/>	<input type="text"/>
85th Percentile Speed (km/h)	<input type="text"/>	<input type="text"/>

2.

Scoring Evaluation

Criteria	Value	Points
Collision History	<input type="text"/>	Enter collision data
Traffic Speeds (km/h)	<input type="text"/>	Enter speed data
High End Speeds (%)	<input type="text"/>	
Traffic Volumes (veh/day)	<input type="text"/>	<input type="text"/>
Pedestrian Generators	<input type="text"/>	<input type="text"/>
Pedestrian Facilities	<input type="text"/>	<input type="text"/>
Bicycle Facilities or Routes	<input type="text"/>	<input type="text"/>
Adjacent Land Uses (residential)	<input type="text"/>	<input type="text"/>
Total		<input type="text"/>

3.

4.

When completing the worksheet, all information should be entered in the yellow cells; the white cells are either headers or calculations results. When the user clicks on the yellow cells, a message with instructions about how to enter the information will be displayed. If the information is entered in an incorrect format, an error message will be displayed.

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1. **General Information.** Includes description of the location, dates of request and analysis, and other relevant information. The information
 - **Location:** descriptive information about the site;
 - **Date of request:** date of the original request for the subject location;
 - **Requested By:** the name of the resident, group or business requesting traffic calming;
 - **Description of Complaint:** text field for entry of problem/complaint;
 - **Analyst:** Town of Ajax staff; and
 - **Date of Analysis:** the date of completion of the analysis; also used to determine the new eligibility date for sites that fail to meet the minimum criteria.

2. **Preliminary Screening.** This is the initial criteria that will determine if the site is eligible for traffic calming.
 - **Posted Speed:** enter the posted speed of the study area in km/h;
 - **Road Type:** select the road type from the drop-down menu;
 - **Grade:** enter the grade of the study area as a percentage (do not type '%'; it will be automatically added by Excel);
 - **Block Length:** enter the distance, in metres, between stop-controlled points along the road;
 - **Collision History:** enter the number of qualifying collisions in the past three years (refer to Section 2.2 for details);
 - **Collision Pattern Identified?:** select "Yes" if a collision pattern not involving speeds can be identified (refer to Section 2.2 for details); select "No" otherwise;
 - **Full Operational/Safety Review?:** Select "Yes" if, based on the collision history, a full operational and safety review is a more adequate approach to evaluate the subject location (refer to Section 2.2 for details); select "No" otherwise;
 - **Is Traffic Calming the Best Strategy?:** Select "Yes" if, based on existing conditions, traffic calming is the best strategy to address the request; select "No" otherwise (refer to Section 2.2 for details);
 - **85th Percentile Speed:** enter the 85th percentile speed in km/h; and

3. **Scoring Evaluation.** If the Preliminary Screening section indicates "Proceed to Scoring Evaluation", enter the required information in the yellow cells under this section (the white cells will retrieve the required information from the Preliminary Screening section).
 - **High End Speeders:** enter the percentage of users driving at speeds of 15 km/h or more over the posted speed limit (do not type '%'; it will be automatically added by Excel);
 - **Traffic Volumes:** enter the two-way average daily traffic (ADT) in vehicles/day;



- **Pedestrian Generators:** enter the number of schools, parks, and other pedestrian generators in the study area;
 - **Pedestrian Facilities:** select whether sidewalks are not present in the study area, present on one side of the street, or present on both sides of the street;
 - **Bicycle Facilities or Routes:** Select “Yes” if the study area has bicycle lanes, sharrows or bicycle routes; select “No” otherwise; and
 - **Adjacent Land Uses (residential):** enter the percentage of residential land uses within the study area (do not type ‘%’; it will be automatically added by Excel).
4. **Macro Buttons.** These buttons are used to save the results from the warrant analysis into the database, to clear the worksheet so a new analysis can begin, and to view the database.
- **Clear Worksheet:** this button will delete all data from the previous analysis from the worksheet so a new analysis can be conducted;
 - **Save to Database:** this button will add the data from a completed analysis to a database contained in the Excel file; and
 - **Go to Database:** this button leads to the database included all locations and their respective analysis results that have been therein previously saved.

4.2 Traffic Calming Warrant Database

The spreadsheet tool includes a database where data from all previous analyses can be saved. The database contents can be manipulated freely, allowing users to sort and filter the data at their convenience. **Because the contents of the database are not protected, it should be handled carefully so information is not lost. It is recommended that backup copies of the spreadsheet be created upon completing analysis for each request.**

The database includes a macro button to return to the warrant worksheet, and the user can show and hide details by clicking on the [1] and [2] buttons in the top left corner of the spreadsheet. Users are also able to add comments manually in column Y, as well as regenerate the warrant worksheet by clicking on the corresponding macro button. A screenshot of the database is shown in **Exhibit 13** highlighting all these options.



Exhibit 13: Traffic Calming Warrant Database

	A	B	C	W	X	Y
		Location	Date of Request	Score	Result	Comments
1						
2						
3	Click [1] to show/hide details					
4						
5						
6	Return to Warrant					
7						
8						
9						
10	Regenerate Worksheet					
11						
12	To regenerate the worksheet for a location, click on the desired location name and then on "Regenerate Worksheet"					
13						
14						
15						
16						
17						
18						
19						
20						

5. Conclusion

This report represents the final component of the traffic calming warrant update initiated by the Town of Ajax with the purpose of making the process more efficient and fair. The new warrant addresses local needs identified by Town staff over several years using the previous version of the warrant.

Some of the highlighted improvements include the elimination of a score-based ranking and the creation of two chronological lists, including a General List and a Priority List (for requests experiencing the highest speeds); the consideration for high end speeders, which can represent a safety concern even when overall speeds are within acceptable levels; and the reduction in the number of occasions of public involvement throughout the process, making it faster and less costly.

The new warrant has been evaluated by means of pilot testing to ensure the updated criteria are reasonable considering local characteristics. Since traffic is dynamic and its characteristics may change over time, Town staff may periodically revise the warrant points and thresholds to adapt to eventual changes in traffic patterns, ensuring the process remains fair over time.

6. Recommendation

The intent of this warrant update was to create a fair and flexible process which allows the Town to focus its resources on highly problematic locations. Despite this, it is possible that the reassessment of the requests from 2012 through 2014 will yield a larger pool of warranted locations than can be accommodated by the current budget. This becomes exceptionally problematic where traffic data, Town staff, and resources are concerned. Standard application in the industry is that traffic data is valid for two years, with three year old data used in rare circumstances where very little development occurred. Thus, if current budgetary concerns require a location to be scheduled outside of the two year validity period, staff would then be obligated to recollect the data, and reassess the location to confirm whether the operational characteristics have changed. Consideration should be given to

increasing the annual Traffic Calming Budget to clear the newly developed Priority and General Lists in as short a time as is possible.

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