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1.0 Glossary

**Administration:**
- Transportation Planning staff members or other City department staff members.

**Arterial Road:**
- A road identified in the City of Windsor Official Plan or a road identified in the Windsor Area Long Range Transportation Study (WALTS). Typically Arterial Roads have 2 or more lanes in each direction and are designed to carry high volumes of traffic across great distances in the City.

**Bicycle Route:**
- A road that has a painted bicycle lane or has been designated as a bicycle route in the Bicycle Use Master Plan (BUMP).

**BUMP:**
- Bicycle Use Master Plan. A planning document for the long term plan for bicycle lanes, multi-use path ways and other on street bicycle friendly improvements.

**Class I Collector Road:**
- A road identified in the City of Windsor Official Plan or a road identified in the Windsor Area Long Range Transportation Study (WALTS). Class I Collector Roads have 1 or more lanes in each direction and are designed to carry moderate volumes of traffic across neighbourhoods and connect Arterial roads with Local Roads.

**Class II Collector Road:**
- A road identified in the City of Windsor Official Plan or a road identified in the Windsor Area Long Range Transportation Study (WALTS). Class II Collector roads are designed to carry passenger traffic in predominately residential area at low to moderate speeds.

**Chicane:**
- A horizontal shift in the road alignment designed to reduce speed. See image reference H-1 or H-6 for a graphical example.

**Community Centre:**
- A City designated building in a neighbourhood designed to facilitate the gathering of local people for the purpose of recreation and entertainment.

**Consultant:**
- A company or professional that assists City Administration in conducting studies.

**Elementary School:**
- A school in which students grades K through 8 attend.

**Environmental Assessment:**
A process that is provincially mandated for all road construction projects in which the roadway alignment, width is changed or when traffic calming is be applied. The process includes public consultation, engineering design, provincial approvals and post construction monitoring of the results.

**High School** - A school in which students grades 9 through 12 attend.

**Horizontal Deflection:**
- Any change in the alignment of a roadway either to the left or right that would force a vehicle to turn the wheel to follow the pavement.

**Local Road:**
- A road identified in the City of Windsor Official Plan or a road identified in the Windsor Area Long Range Transportation Study. Local Roads are intended to facilitate access to residential properties and small neighbourhood areas with low volumes of traffic at lower speeds.

**Median Island:**
- A physical barrier along the centre of a road designed to separate the opposing lanes of traffic. Can also be used to reduce lane width thus slowing traffic down, used frequently to prevent undesirable left turns and to protect residential streets from cut through traffic.

**Neighbourhood:**
- A residential area bound on all sides by arterial or collector roads, railways or natural land forms such as watercourses.

**Open House/Drop In:**
- A public meeting intended to display information to keep the public up to date with projects and studies. An open house is also used to collect and share feedback, ideas and information with the public.

**Park:**
- An area of green space and or recreation.

**Planning Advisory Committee:**
The Planning Advisory Committee makes recommendations to City Council on different planning related matters, including re-zonings, official plan amendments and various policy works.

**Religious Building:**
- A facility designed to provide a gathering place for worship.

**Residential:**
- An area of land zoned and or occupied by people for the purpose of home use. Zoning districts RDX.X are for residential purposes.

**Speed Bump:**
- A small size vertical deflection of approximately 30 – 60 cm in width and 8 – 12 cm in height. Typically these are installed on commercial properties to slow traffic to 5km/h.

**Speed Hump:**
- A large size vertical deflection with a standard design width of 4 to 7 metres wide and a maximum of 80 mm in height. Speed humps are designed to encourage traffic to reduce their speed to the posted speed limit.

**Traffic Calming Device:**
- Any vertical, horizontal or visual change to the public right of way built with an intention to reduce vehicle speed or volume and to improve the safety of other non motorized modes of transportation.

**University / College:**
- A post secondary institution designed for higher learning, facilities usually have a large number of buildings and may include residence facilities. Typically a large generator of pedestrian traffic.

**Vertical Deflections:**
- Any change in the grade of the road either up or down designed to reduce the speed of a vehicle by making travel over such works uncomfortable for the driver and passengers. (ie: Speed Humps)
**VPD:**
- Vehicles Per Day: the average number of vehicles per day in both directions on a given segment of road.

**VPLPH:**
- Vehicles Per Lane Per Hour: The average number of vehicles per directional lane of traffic shown as a per hour figure.

**VPH:**
- Vehicles Per Hour: The average number of vehicles in all directions per hour on a given segment of road.

**WALTS (Windsor Area Long Range Transportation Study)**
- A City Council approved document outlining future transportation network improvements, goals and objectives.

**Warrant Scoring System:**
- An evaluation method giving points to a specific cause based on it meeting set criteria on a quantitative scale. Warrant Scoring Systems are employed for various traffic evaluations including All Way Stops, Traffic Signals etc.

**85th Percentile Speed:**
- The highest speed at which 85% of traffic is traveling at or below. 85th percentile speed delineates the slower 85% of traffic from the fastest 15% of traffic. Typically this figure is used to describe the amount of traffic that is traveling in excess of the speed limit.
2.0 Executive Summary

2.1 What is Traffic Calming?

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”. The reason for traffic calming is to alleviate safety issues relating to high traffic volumes and high traffic speeds on roads that are not designed nor intended to handle such traffic issues.

2.2 Where Can We Apply Traffic Calming?

The proposed Traffic Calming Policy is intended to deal with Traffic Calming on residential Local and Collector roads only. The Canadian Guide to Neighbourhood Traffic Calming highlights the fact that the majority of traffic related issues focus directly on traffic in residential areas. Though traffic problems may exist elsewhere, the most pressing safety issue is traffic in residential areas. Therefore, this policy will only deal with residential neighbourhood traffic calming on Local and Collector Roads in the City of Windsor.

The proposed policy deals with Traffic Calming on a Neighbourhood basis only. Traffic Calming devices should never be placed on a single street because traffic issues may be redirected to other adjacent streets as opposed to eliminating the problem all together.

2.3 How Do We Determine The Need For Traffic Calming?

The need for Traffic Calming must always rely on quantitative data to measure and detail problems. Quantitative data allows for an objective review of the project for two major reasons:

a) A problem statement conceived from quantitative data is a requirement of any Environmental Assessment for any Traffic Calming project. Though subjective data may be helpful in pointing Administration in the direction of potential problems, a full technical evaluation of these problems is a requirement of the Environmental Assessment Act.

b) Using quantitative data allows for a review of neighbourhoods in an objective manor. Without this objective study we may fall into the trap of allowing the most vocal neighbourhoods to get unneeded traffic calming projects while neglecting neighbourhoods that are suffering from real traffic problems.

A warrant scoring system is proposed to evaluate the need for traffic calming. This system is intended to collect quantifiable data to be used to determine both the need for traffic calming and the type of traffic calming devices.

Following the Official Plan’s designation of specific roadways, Local Roads and Class I / Class II Collector Roads are scored separately. The proposed warrant
scoring system developed to determine the need for traffic calming in existing
neighbourhoods takes into account the following criteria:
• Excessive Speed
• Excessive Volume
• Bicycle Routes
• Collisions
• Pedestrian Generators
• Residential Frontage

Using these criteria will ensure that traffic calming is placed where it is required
and will allow for a consistent and objective application of traffic calming
throughout the City of Windsor. The evaluation of a specific neighbourhood will
yield a score that translates to a list of appropriate traffic calming devices that
specifically deal with identified problems. The traffic calming devices and their
effectiveness are consistent with the research conducted by the Transportation
Association of Canada’s Publication: The Canadian Guide to Neighbourhood
Traffic Calming.

2.4 Why Not Put Speed Humps Everywhere?

Speed humps have been suggested as the easiest and most efficient means of
reducing traffic problems on streets. However, speed humps cause a wide range
of other serious issues that have resulted in their reduction in use and even
removal in some municipalities. Speed humps reduce speed for all traffic
including emergency vehicles and thus increase response times in emergencies.
Speed humps have also been known to cause injuries to Emergency Services
personnel and the public at large. Elderly and disabled people have difficulty
with speed humps as they can cause injury and pain to those with spinal problems.
The proposed Traffic Calming Policy has taken all of these issues into account
and recommends limiting use of speed humps and other vertical deflections to
roads designated as Local in the Official Plan. Speed humps should never be
placed on emergency routes, transit routes or on Collector Roads. Speed humps
should only be used where a severe traffic problem exists.

2.5 What Are Other Municipalities Doing?

Other Ontario municipalities have been employing traffic calming policies for
some time now. This has allowed Administration to view the positives and
negatives of those policies in an effort to avoid pitfalls experienced by those
municipalities. Most municipalities employ a warrant scoring system to
determine the need for traffic calming, they include the City of Waterloo, Town
of Oakville, City of Oshawa. Those warrant scoring systems evaluate a number
of criteria to determine the need for traffic calming. The City of Ottawa is an
example of where a warrant scoring system was not employed. Traffic Calming
projects were approved without an evaluation based on a quantifiable need and
they now face a $8 million backlog of those projects. Since then, the City of
Ottawa has begun to work on a warrant scoring system. In a report to their
Transportation and Transit Committee it was stated, “One of the key conclusions
of the study was that a policy/set of guidelines should be developed to establish consistent implementation of traffic calming measures” (City of Ottawa, June 11, 2001). It is clear that a warrant scoring system that identifies actual quantifiable problems is the only way to proceed with any traffic calming project.

2.6 What Is The Role Of The Public And The Planning Advisory Committee?

Public consultation is a large component of any traffic calming project. Members of the public will be responsible for bringing traffic calming requests to members of Council and Administration for evaluation. In existing neighbourhoods that meet the warrants for traffic calming, there will be public meetings following the Class B Environmental Assessment schedule. Additionally, the public will play a key role in identifying problem areas that need to be studied to collect objective data.

The Planning Advisory Committee (PAC) and subsequently Council will have a role in approving traffic calming in new neighbourhoods. It is proposed that all new neighbourhoods have extensive traffic calming works to prevent traffic problems before they start and to place sustainable transportation modes such as walking at a higher priority than motorized vehicles. At the plan of subdivision stage PAC and Council will be requested to approve the traffic calming plan for the subdivision based on the criteria in the Traffic Calming Policy.

2.7 The Environmental Assessment Process

The Environmental Assessment process must also be followed throughout any Traffic Calming project. Major requirements of the process include the collection of objective data to formulate a problem statement, a presentation of alternative solutions to the public for consultation, selection of a preferred solution, the final environmental study report and the implementation of the preferred solution. The proposed Traffic Calming Policy and its procedure for evaluating the need for traffic calming is consistent with the Environmental Assessment Act.

2.8 Traffic Calming In New Neighbourhoods

Traffic Calming in new neighbourhoods should be on a proactive basis. The Traffic Calming Policy proposes that traffic calming should be employed in all new neighbourhoods during construction of the road network. The goal of traffic calming in new neighbourhoods is to eliminate traffic problems before they start by creating a transportation network, which places sustainable transportation modes at a higher priority.

To achieve this goal, traffic calming must be placed on all Local and Collector Roads in a subdivision following the guidelines below:

- Roundabouts or traffic circles at all intersections between two Local Roads.
- Chicanes will be required on all roads where there are long straight sections (300 metres or more in length).
• Lane narrowings combined with pedestrian crossings where appropriate.
• Curb extensions are required at all intersections of Local and Collector Roads.
• Median islands should be used extensively throughout the neighbourhood to prevent cut through traffic between Collector and Local Roads where required.

2.9 Conclusion:

This Traffic Calming Policy marks an important step in moving towards safer neighbourhood design for all modes of transportation. Though the argument can be made that traffic calming should be placed in every neighbourhood, it is not practical, financially responsible or necessary to do so. Therefore, the need for traffic calming must be studied to determine an actual need and to prioritize projects so that areas that need traffic calming, get traffic calming. In order to achieve consistent application of Traffic Calming we need to achieve the following.

• An objective warrant study system and subsequent policy to evaluate the need for traffic calming in existing neighbourhoods.
• An objective comprehensive plan to implement consistent and effective traffic calming in new neighbourhood designs.
• Additional supportive text in the Official Plan supporting traffic calming in both existing neighbourhoods and new subdivisions.

The backbone of any traffic calming policy is its warrant system of evaluating roads in neighbourhoods. Using a warrant scoring system is the recognized means of determining the need for traffic calming. Use of objective data to point to specific problems is required through the Environmental Assessment Act and therefore is the driving force behind the warrant scoring system. The Traffic Calming Policy for Windsor also uses this scoring system to point us in the direction of effective traffic calming measures necessary to solve traffic problems in neighbourhoods. This method of determining which devices are appropriate is a first for a Traffic Calming Policy and has spurred interest by other municipalities looking to improve their traffic calming policies.

The recommended list of traffic calming devices and potential locations for their use is based on the following:

• Consultations with other city departments have brought forward cautions regarding use of vertical deflections in neighbourhoods, particularly by Emergency Services and Transit Windsor. As a result, a compromise is proposed similar to those reached in many other municipalities in which vertical deflections can only be used on Local Roads where severe traffic problems exist.
• Consultations with Windsor Accessibility Advisory Committee and they Bicycle Committee have yielded a better understanding of their user specific issues and concerns with specific traffic calming devices and their design.
• Research conducted by the Transportation Association of Canada conducted to determine the proven effectiveness of each device to alleviate specific traffic problems.

• A review of problems and issues faced by other municipalities based on their current policies and subsequent reports to their councils on traffic calming projects.

Based on consultations with other departments, other agencies, research of other municipalities Traffic Calming Policies and a peer review by a qualified consultant, we offer the following recommendations for the new Traffic Calming Policy for the City of Windsor:

• To study the need for Traffic Calming in existing neighbourhoods by employing the prescribed Warrant Scoring system in Appendix A developed for use in the City of Windsor to quantify traffic issues and to prioritize traffic calming projects.

• The study of Traffic Calming be on a neighbourhood basis and further that no ad hoc traffic calming measures be constructed without a full transportation evaluation of the entire neighbourhood based on the Traffic Calming Policy.

• To use Traffic Calming measures according to the levels prescribed in Appendix B Figure 2 for Local Roads and in Appendix B Figure 3 for Class I / Class II Collector Roads

• That no vertical deflections (Speed Humps etc.) be placed on emergency routes or transit routes.

• The implementation of Traffic Calming in new neighbourhoods based on the criteria outlined in Appendix C to prevent future traffic problems by proactively installing Traffic Calming devices during construction of new subdivisions.

• The additional supportive text outlined in Appendix D for inclusion in the Official Plan.

Studying the need for traffic calming is time consuming and requires specialized equipment. The Public Works – Transportation Planning division has some of the required equipment but in order to adequately perform existing duties and keep up with the evaluation of neighbourhood traffic patterns there will be a need for additional Traffic Counting devices. Transportation Planning does keep records of traffic volumes on all Arterial and Collector Roads in the City, however in order to study the need for traffic calming, traffic volume counts need to be performed on a much more intense scale. In order to complete a study of a neighbourhood, Transportation Planning will be required to evaluate almost all streets in a given neighbourhood including local roads. Transportation Planning recommends the following:
• The purchase of 6 new traffic volume and speed counters and tubes for use by the Transportation Planning Department to help collect data for Traffic Calming at a Cost of Approximately $10494.00

Human resources and time is an additional concern. Current staff levels are such that existing staff will not be able to perform these studies in a timely fashion. It is estimated that the Transportation Planning Department will require one additional staff member to perform not only the warrant studies but also follow through with the lengthy Environmental Assessment Process which can take up to and beyond one year to complete. Public Works – Transportation Planning is requesting direction from PAC and subsequently City Council regarding the number of Traffic Calming projects they would like to see conducted in a year. Based on our early estimates we expect that we can complete 4 to 6 traffic calming evaluations per year and up to 2 Environmental Assessments. One of the most fundamental issues is the lack of predictability regarding the number of neighbourhoods that will meet the warrants. Therefore, if there are more than 2 neighbourhoods that meet the needs for traffic calming, we will have to delay the remaining Environmental Assessments until subsequent years because of staff time availability.

• The hiring of one additional Transportation Planner to work on traffic calming projects, collecting data, assembling reports and undertaking Environmental Assessments.

Overall, Public Works – Transportation Planning is excited about the opportunity to begin reviewing neighbourhoods for traffic calming. We see this policy as an important tool to prevent and reduce traffic issues for neighbourhoods whom have been suffering from excessive traffic problems for some time.
3.0 Introduction To Traffic Calming

3.1 What Is Traffic Calming?

Traffic Calming is the act of reducing traffic speed and volume on a group of streets within a specific geographic area by implementing proven methods to reduce identified problems. The technical definition of 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.” (3, Canadian Guide to Neighbourhood Traffic Calming) Positive changes in the traffic character of the neighborhood can be achieved when Traffic Calming is implemented in a reasonable and well-thought manner.

The underlying reason for any Traffic Calming initiative is to alleviate or solve underlying safety issues that come with increased traffic volume and speeds on roads operating not as they were intended. Initiation of a traffic calming study can be brought forward by the public, elected officials or from within Administration itself.

3.2 Where Can We Apply Traffic Calming?

| This policy is intended to deal with traffic calming on Official Plan designated Local and Collector Roads in predominantly residential areas only of the City of Windsor. The need for traffic calming in other areas may exist; primarily in commercial shopping districts and the downtown core; the ability to effectively implement such devices is limited. The Canadian Guide to Neighbourhood Traffic Calming highlights the fact that neighbourhoods deal the most with traffic problems and hence this document was directed towards them. Additionally, this guide only deals with residential Local and Collector Roads. |

Commercial area traffic calming has not been studied in depth. Where traffic calming can be implemented in commercial districts it should be combined with urban design features that are pleasing and compliment the area in which it is implemented. In the future, there may be an additional policy to deal with those specific areas, or certain projects may be reviewed in terms of possible traffic calming devices. Clearly, more research is required on this topic. At this time it is more important to deal with neighbourhood traffic calming issues first.

Implementation of Traffic Calming necessitates a great degree of care and study. It is the intention of this policy to provide a framework for the City of Windsor. This framework will enable administration to determine proper and effective courses of action when dealing with concerns relating to traffic volume, excessive speed, pedestrian and vehicular safety on a neighbourhood basis only. Though individual streets will be studied to ensure that they meet the warrants, this does not mean that only individual streets will receive traffic calming. Administration believes that traffic calming should be a part of an overall neighbourhood traffic management plan. The neighbourhood areas will follow natural landforms, railways, collector roads, arterial roads, school catchment areas and ward...
boundaries. At the commencement of the study, the neighbourhood area will be defined by administration.

3.3 How Do We Determine The Need For Traffic Calming?

The rationale for traffic calming is extremely important to ensure that funding and attention are directed to key problem areas. Strict guidelines exist to ensure that traffic-calming projects are initiated in neighbourhoods with real quantitative problems (i.e., high traffic volumes). Following these warrants will ensure that the right solution is applied to the right problem. Though the warrants are technical, they are an important part of assessing the need for traffic calming. The Canadian Guide To Neighbourhood Traffic Calming States:

“Quantify the problem. Some problems are more significant than others. Some are all-day problems, whereas others occur only at certain times of the day, or only in one direction. To select appropriate traffic calming measures, it is important to quantify the extent of the problem.” (Canadian Guide to Neighbourhood Traffic Calming, p1-5)

This statement highlights the fact that traffic patterns for all modes of travel fluctuate during the day. In particular, pedestrian movements and vehicle movements in the morning between 7:30 am and 9:30 am are at their highest. This is the rationale behind reviewing all streets for a much longer time frame to get a better picture of transportation movements in a given neighbourhood entity.

Upon identifying the degree of the problem by following the warrants, possible solutions can be chosen based on their proven effectiveness in dealing with the specific problems identified during the assessment phase of the project. There are varying types and degrees of Traffic Calming devices all with different affects on traffic, including traffic generated by the public and vehicles operated by emergency services, public works and transit services.

Public perception often times clouds the reality of traffic issues in a neighbourhood area. Though some residents may perceive that there is a problem based on their own judgment and experience in a neighbourhood, this does not necessarily translate to an actual quantifiable problem. Furthermore, in some neighbourhoods, traffic problems have existed for a number of years and as such people have just “lived” with them. By quantifiably identifying the problem we can determine where the real problem areas exist. Using the warrant scoring system will reduce bias towards areas who perceive that there is a traffic problem. Instead, all neighbourhoods will have an equal opportunity to make their case for traffic calming based on raw traffic data and facts.

Without this objective study we may fall into the trap of allowing the most vocal neighbourhoods to get unneeded traffic calming projects while neglecting neighbourhoods that are suffering from real quantitative traffic problems, who have been living with those same problems for many years.
3.4 Why Not Put Speed Humps Everywhere?

Examples throughout North America and Europe exist where problems with speed humps have prompted a review of their use in many municipalities. The fact is that speed humps are a double edged sword. On one hand they are very effective at reducing traffic speeds, on the other hand they cause an increase in emergency response times, injure and kill motorists, create noise problems for nearby residents and pose a serious barrier to those with spinal problems and disabilities.

In Montgomery County, Maryland an anti-speed hump group was formed to fight the use of speed humps in neighbourhoods. The principal reason this group opposes speed humps are because of the danger to emergency response personnel, the increase in emergency response times and injury to residents who are elderly and those who have bad backs who must drive over these speed humps. In Portland, Oregon similar backlash to speed humps has also come about but a compromise was reached, such that speed humps were removed from all emergency access routes. “After neighbourhood groups and rescue agencies spent two years arguing over traffic safety, City officials in Portland worked out a compromise last year by banning speed humps on specially designated routes for emergency vehicles, but allowing them to be used elsewhere.” (Seattle Times, November 19, 1998)

A recent study undertaken by the University of Texas found that speed humps actually cause more deaths than they prevent. “for every pedestrian killed by a speeder, 37 people may die as a result of the delayed response times caused to police, fire and ambulance services.” Therefore it is very important that the City of Windsor Traffic Calming policy maintain the use of speed humps only for severe traffic problems only. Though some residents may perceive that these speed humps will save peoples lives, it is in fact the exact opposite, speed humps slow traffic but also slow emergency response and thus are blamed on numerous deaths in the United States each year. Therefore, speed humps should be used sparingly, reflecting that there is an inherent liability to placing these devices where they are not needed as they may result in delays to emergency response and thus cause the deaths of people in neighbourhoods with speed humps.

Speed humps also cause discomfort to drivers who travel over them. Individuals who are disabled or who are elderly have a different perception of speed humps. In the United States there are currently challenges before various courts based on the Americans with Disabilities Act or ADA. Because these humps prevent reasonable access to roads, they result in a barrier to disabled persons who drive because of the pain and discomfort that they cause. We are therefore cautioned that placing speed humps may result in a reduction of access to individuals who are disabled or who suffer severe back pain. The ADA published a report in 1999 titled “Accessible Rights of Way: A Design Guide”. Chapter 3 – section 3.8.6 states “Drivers with disabilities report that a speed hump is a barrier to roadway use, not merely an inconvenience. The jarring that can occur even at low speeds can be painful or dangerous. Other traffic calming approaches should be considered where feasible.”
This long list of problems with speed humps has prompted a number of opposition groups to them. In many cases these groups have been successful in gaining the removal of many speed humps throughout the United States. These anti-speed hump organizations are growing in number. Here is a list of some of them:

- Seminole Majority Against Speed Humps [http://speedhumps.50megs.com](http://speedhumps.50megs.com)
- Coalition for Free Streets [www.speedhumps.com](http://www.speedhumps.com)

The plain and simple fact is that Speed Humps should be used sparingly, where only the most severe traffic problems exist. Speed humps are a valuable tool in the traffic calming tool box, but they are not the only tool. When they are used improperly or for the wrong reasons they cause more harm than good.

There is nothing worse than a poorly planned traffic calming plan. Below is an image from Santee, California where poorly planned unneeded speed humps were removed.

![Image of speed humps being removed](image)

### 3.5 What Type Of Traffic Calming Measures Are Appropriate?

The Canadian Guide to Neighbourhood Traffic Calming provides a detailed list of appropriate traffic calming measures for Canadian roads. This list however is a suggested list and therefore it is better to ensure that the devices included in any municipal policy reflect the needs and concerns of the City, particularly emergency services, transit services and all other affected service units. Some traffic calming devices listed within the document also have caveats attached noting that they have limited or no real benefit and therefore each municipality
should determine if they should employ them or not. Items such as all way stops are included in the document, but have been proven to promote speeding mid-block between them and therefore it is left to the individual municipality to judge whether each device is appropriate for their city. The list of appropriate traffic calming devices proposed in this policy is listed on page 43 for Local Roads and page 45 for Collector Roads.

Additionally, there are a number of concerns with the use of any type of Vertical Deflection or “Speed Hump” type traffic calming devices. These concerns typically stem from emergency services and transit services. Therefore, this policy is recommending that such vertical deflections be only used on Local Roads and in locations where a severe traffic problem exists.

In all cases, detailed study of a neighbourhood will reveal the most appropriate location for these traffic-calming devices. It is required that all traffic calming devices strictly follow the design criteria within the Canadian Guide to Neighbourhood Traffic Calming in order to ensure that the devices are safe for all users and are signed correctly to warn drivers of the approaching device.

3.6 What Are Other Municipalities Doing?

Windsor is one of the last municipalities of its size in Canada to look at implementing a traffic calming policy. Though some view this as a disadvantage, in reality it gives us an opportunity to review the long-term effects of traffic calming in other areas, and allows us to learn from other municipalities mistakes.

Most municipalities employ a warrant system to determine if traffic calming is actually desirable and to quantify the problem for the Environmental Assessment Process.

The City of Waterloo employs a very simple, strictly traffic related warrant system. That policy has 3 criteria that must be met:
- The 85th percentile speed must be 10km/h over the posted limit
- Traffic volumes must meet a set threshold and
- There will be no impact to Transit Service.

If all three of these cannot be met, than no traffic calming will take place. This policy is quite cut and dry, but it does not take into account all of the basic reasons for traffic calming, nor does it point to potential solutions based on identified problems.

The City of London employs another very simple but somewhat strict traffic calming warrant system. London requires 4 criteria to be met in order to being a traffic calming study:
- The potential for “cut through” traffic.
- The potential for high volumes of local traffic
- The potential for high speeds
- Risk of unacceptable levels of pedestrian-vehicle conflicts
The City of Oshawa also employs a simple warrant system using the following criteria:
- 85\textsuperscript{th} percentile speed must be greater than 10km/h over the posted limit
- Cut through traffic
- Excessive Traffic Volume

The Town of Oakville also has recently approved a warrant scoring system that is slightly more complex utilizing a point structure. This warrant scoring system criteria for Oakville includes the following that are tabulated and added for points:
- 85\textsuperscript{th} percentile speed
- High end speeders
- Pedestrian facilities
- Residential driveways
- Sidewalks or no sidewalks
- Number of collisions

Similar to the City of Waterloo, this policy only directs Administration to whether there is a need or no need for traffic calming. There is no correlation between the points, problems and the potential solutions for those problems.

In the United States, the City of Sarasota Florida has a warrant scoring system used to quantify the extent of the problem. Their warrant system lists criteria such as:
- 85\textsuperscript{th} percentile speed
- Percentage of cut through traffic
- Vehicle volume
- Pedestrian volume
- Number of accidents per year

In all cases, all municipalities require a quantifiable need to justify the start of an Environmental Assessment process. A problem statement with quantifiable information is a requirement to begin any Environmental Assessment project in Ontario and must follow approved guidelines for determining the problems. There is an ever-expanding list of municipalities utilizing scoring systems to determine the actual problem because they are the most effective means of determining the problem and pointing to a logical solution.

Situations do exist where a strict warrant system has not been implemented in a municipality. This lack of a warrant system has brought great peril to those municipalities whose Traffic Calming programs do not have strict guidelines regarding the justification for traffic calming devices. The City of Ottawa is an excellent example of a municipality without a scoring system.

Currently, the City of Ottawa has an 8 Million dollar backlog of Traffic Calming projects. (2005 ORGA Conference – Strategy for Safer Streets) This backlog is because there was little or no control over where and when traffic calming should be placed. Political reasons, rather than technical justification resulted in un-
needed traffic calming projects being approved. The City of Ottawa has had to go back to the drawing board with their Traffic Calming policy. The message posted on their Traffic Calming Web Site states:

“While the demand for traffic calming has increased, the funds for the program have not. The City is therefore developing a priority system to help the Transportation Committee decide when and where to install traffic calming measures. Points will be awarded for: Volume, Speed, Collisions, bicycle and transit routes, and cost.” (City of Ottawa Traffic Calming Web Site)

The City of Ottawa is now looking to change how it proceeds with assessing the need for traffic calming devices. The City of Ottawa has begun to undertake a comprehensive study to develop a list of guidelines or criteria from which to determine the need for traffic calming and to ensure consistency.

“One of the key conclusions of the study was that a policy/set of guidelines should be developed to establish consistent implementation of traffic calming measures” (Report to Transportation and Transit Committee, City of Ottawa, June 11, 2001)

From the research that has been conducted by administration, there have been good examples of policies, and not so good examples.

It is clear that a warrant system that identifies actual quantitative problems is the only way to proceed with any traffic-calming project. Administration’s recommended criteria is based on examples from other municipalities as well as a deep understanding as to what is important here in Windsor.

3.7 What Has The City Of Windsor Been Doing?

The City of Windsor has fallen into the trap of placing all way stops to alleviate traffic problems. Unfortunately, using all way stops in this manor actually promotes speeding between stop signs because drivers are attempting to make up lost time. Additionally, unwarranted all way stops lead to compliance problems or more frequent rolling stops instead of complete stops. This compromises pedestrian safety because pedestrians “expect” traffic to stop at all way stops to allow them “right of way” to proceed to cross the street. When all way stops are used as a speed control measure instead of a right of way control they increase the safety risk to crossing pedestrians who have a false sense of security.

Unwarranted all way stops bring many other associated problems to a neighbourhood. Those problems include:
- Increased air pollution
- Increased noise pollution
- Decrease in pedestrian safety through non compliance at unwarranted all way stops
- Decrease in pedestrian safety through an increase in mid block traffic speeds
- Waste of fuel
- An overall decrease in quality of life in a neighbourhood.
At a typical four way stop, the following emissions are released collectively, from all vehicles traveling through a stop each year (Ministry of Municipal Affairs and Housing):

- 657 kg of hydro carbons
- 8,760 kg of carbon monoxide
- 675 kg of nitrogen oxide
- 65,700 kg of carbon dioxide

Residents often use the rationale that speeding drivers on their particular street will harm their children, but at the same time they are perfectly willing to subject themselves and their children to additional air pollution. This is the reason why other municipalities have gone as far as to add wording in their all way stop policy noting the hazardous environmental impacts of unwarranted all way stops. Additionally, some municipalities have also found it prudent to note in the policy that All Way Stops will not be implemented as a speed control device. Those municipalities include the Region of Halton, City of London, Region of Niagara and the City of Kingston.

By embracing and approving a traffic calming policy, we will provide neighbourhood residents with a viable plan to reduce speed by using traffic calming in place of All Way Stops. Using this document as a guide to initiate proper programs of reducing speed will improve the environment in a neighbourhood both in terms of speed and safety, but also through the reduction of air and noise pollution.

3.8 What Is The Role Of The Public And The Planning Advisory Committee?

Public participation in the process is key to ensure that any traffic calming solution meets the expectations of the public. The public will be welcome to participate in all aspects of the Traffic Calming Study, including the initiation process. To initiate a traffic calming study; residents, through elected officials, can bring to our attention traffic safety concerns on streets and request that a neighbourhood area be evaluated to determine the need for traffic calming. The public will have a key role in identifying neighbourhood problem spots for Administration to study more in depth. Residents will also have a say in location and type of traffic calming measures identified within the warrant study. Through the Environmental Assessment Process the public will be invited to provide comments, questions and suggestions based on conceptual designs provided at public meetings.

The Planning Advisory Committee’s role in traffic calming is limited to its approval of new subdivisions. This policy endeavors to deal with Traffic Calming in new neighbourhoods on a proactive basis. Therefore it is expected that part of the approval for subdivisions will include a recommended design for traffic calming devices. This will also give nearby residents and members of PAC an opportunity to comment and to provide guidance on the proposed traffic calming plan for new neighbourhoods.
3.9 How Does The Environmental Assessment Process Work?

The Environmental Assessment or EA process is a provincially mandated process under the Environmental Assessment Act, R.S.O 1990. This process is undertaken for many different types of Municipal projects including “retrofit” projects such as traffic calming in existing neighbourhoods. The EA process must be consistent and follow the following guidelines:

• Consultation with affected parties early in and throughout the process, such that the planning process is a cooperative venture.

• Consideration of a reasonable range of alternatives, both the functionally different “alternatives to” and the “alternative methods: of implementing the solution. The “Do nothing” alternative, which provides a benchmark for the evaluation of alternatives, must be considered.

• Identification and consideration of the effects of each alternative on all aspects of the environment, i.e., the impact on the natural, social cultural, technical and economic/financial environment. The level of detail will vary depending primarily on the significance of the effect and the stage of the study.

• Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects.

• Provision of clear and complete documentation of the planning process followed, to allow “traceability” of decision-making with respect to the project.

The EA process also encompasses requirements for post project monitoring to ensure that at the completion of the project there is a noticeable improvement. Administration is well versed in the EA process and will follow this process throughout any traffic calming study. See Figure 1 for a flow chart break down of the EA process for Traffic Calming.
3.10 How Does This Policy Interact With The Environmental Assessment Process?

There are a number of ways this policy deals with the requirements of the Environmental Assessment Process. At the beginning of any EA process, there is a need to identify the problem or opportunity. This is where the warrant system is employed to identify the problem. According to the EA Process:

“Identification and description of the problem or opportunity. Municipalities generally undertake projects in response to certain identified problems or deficiencies. On the other hand, there may be opportunities, which need to be addressed. These problems or opportunities may or may not be obvious to the public but it is necessary to document factors, which lead to the conclusion that an improvement or change is needed. Earlier studies or reviews undertaken by the proponent may be available to assist in defining the problem. This phase should therefore lead to the development of a clear statement of the problem or opportunity being addressed.” (page A-24, Municipal Class EA)
Using the warrant system in the policy will result in a “...clear statement of the problem...”. Using objective, quantitative data is the only means to create a clear statement. Therefore, under the required EA process, subjective data cannot be used to form the basis of a problem statement.

Under the “Alternative Solutions” phase of the EA process, there are requirements to deliver various options to solve the problem(s) identified in the problem statement. Based on the scoring system developed, a clear list of traffic calming solutions are listed with their appropriate use to deal effectively with problems. The scoring levels will also be used to better narrow down the traffic calming device choices.

The proposed Traffic Calming Policy also spells out important times when the public should be involved. These mandatory contact points outlined in the EA process are noted as the minimum number for a Schedule B Municipal Class Environmental Assessment. The traffic calming policy actually requires one additional public meeting than what is mandated by the Environmental Assessment Act because administration recognizes the importance of involving the public as much as possible.

Overall, the Traffic Calming Policy follows the guidelines of the Environmental Assessment Act as required by law.

3.11 Urban Design, Neighbourhood Design, Pedestrian and Cyclist Safety

There have been many comments and concerns brought forward regarding the lack of pedestrian and cyclist friendly neighbourhoods in Windsor. Though this fact cannot be disputed, this policy cannot begin to address all of those concerns. This policy however can act as a catapult for other planning and urban design studies centered around pedestrian and cyclist friendly neighbourhoods. This policy can only deal with the calming of vehicular traffic.

Inherently, traffic calming does increase the safety of all street users. However, this policy does not address the macro design issues that plague our neighbourhoods today. These issues relate directly to the concerns brought forward by many individuals and include things such as:

- pedestrian oriented development
- pedestrian connectivity,
- sustainable development,
- intensification of development
- urban design features
- walking and cycling friendly neighbourhoods

Implementing pedestrian oriented design programs in neighbourhoods or intensifying development in residential areas to make alternative forms of transportation more attractive is not the objective of any traffic calming policy,
nor can it be a part of this policy. Though everyone can see the merit in implementing such neighbourhood designs, they cannot be a part of this policy.

It is expected that the Traffic Calming policy will begin to address some of these issues relating directly to traffic, but clearly more work needs to be done to deal with the lack of sustainable pedestrian, cyclist and transit oriented development within the City of Windsor. However, those Urban Design elements are outside the realm of control of the Public Works – Transportation Planning Department.

3.12 What Does The Official Plan Say About Traffic Calming?

The Official Plan contains supportive statements regarding traffic calming. Currently, those supportive statements are within the Urban Design component of the Official Plan recognizing the need to integrate streetscaping elements into the design of Traffic Calming devices.

The Official Plan’s Section 8 – Urban Design deals with the aesthetic and civic image values to which the City of Windsor is committed too along roads and streets.

**Streetscaping Objective Section 8.11.1.1 States:**

“To achieve an integrated and attractive streetscape through design features which accommodate pedestrian and vehicle needs.”

**Streetscaping Policy Section 8.11.2.6 States:**

“Council may support the use of traffic calming measures to reduce the negative effects of motor vehicle use, alter driver behaviour and to improve conditions for pedestrians and cyclists.”

The supportive phrases above are clearly limited and do not take into account fully the scope to which traffic calming needs to be addressed. In order for this policy to be the most effective there needs to be additional wording put into the Official Plan. Proposed additional supportive text in the Official Plan is found later on in this report in Appendix “D”

The Official Plan’s current wording is in support of traffic calming and further is consistent with the goals of this policy which is reduce the negative effects of motor vehicle use by altering driver behaviour using traffic calming measures.
4.0 The Goals and Objectives of Traffic Calming

The goal of any traffic calming project is to restore streets to their intended function. This function is to provide both mobility and accessibility, but in differing combinations, depending on the specific location and classification of the street (City of Oshawa Traffic Calming Policy). In many cases, the most basic reason for traffic calming is that a particular roadway is not operating as it was designed to do. There are very few ways to plan effectively for the impulses of human nature that often times bring about the need to study Traffic Calming solutions.

4.1 Using The Official Plan And Windsor Area Long Range Transportation Study As A Guide

Using the Official Plan’s Section 7 – Infrastructure, to describe the intended purpose of any given street is the start of any Traffic Calming Study. The Official Plan outlines the intended use of all roads in the City of Windsor.

- Class II Arterial Roads shall be designed to carry high volumes of passenger and commercial traffic for intra-city travel at moderate speeds;

- Class I Collector Roads shall be designed to carry moderate volumes of passenger traffic, except in industrial areas where they may carry passenger and commercial traffic, between Local Roads, Class II Collector Roads and Class I and Class II Arterial Roads at low to moderate speeds;

- Class II Collector Roads shall be designed to carry passenger traffic in predominately residential areas at low to moderate speeds;

- Local Roads shall be designed to carry low volumes of passenger traffic short distances at low speeds;

Class I and II Collectors are both intended to serve a more residential purpose, acting as connectors to Arterial and Local Roads. Class I / II Collectors and Local Roads are also intended to carry traffic at lower speeds. Arterial Roads are intended to facilitate intra-city travel at moderate speeds. Therefore, according to the Official Plan, Local and Collector Roads are the most logical streets to traffic calm because they are designated to maintain lower speeds and lower to moderate traffic volumes. Arterial Roads are intended for intra-city travel at moderate speeds with high volumes of traffic and therefore should not be traffic calmed. Discouraging speed and volume from Arterial Roads will only result in traffic looking for residential short cuts. Traffic Calming on Arterial Roads therefore will result in a deterioration of the City’s transportation network.
Though individuals may object to their streets designation in the Official Plan or W.A.L.T.S., it is not the intention or within the scope of this policy to make recommendations on the make up of the road network hierarchy in the City of Windsor. Similar to the consistency that this policy must have with the Bicycle Use Master Plan (BUMP) for bicycle route designation, we must also be as consistent with our use of the Official Plan for each road’s designation.

The traffic volume expectations of any road are also dictated by its designation in Windsor Area Long Range Transportation Study (WALTS). The maximum traffic volumes for roadways by classification are identified in the table below:

<table>
<thead>
<tr>
<th>Road</th>
<th>Road Type</th>
<th>VPLPH</th>
<th>VPH</th>
<th>VPD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector</td>
<td>Class I</td>
<td>650</td>
<td>1300</td>
<td>13000</td>
</tr>
<tr>
<td></td>
<td>Class II</td>
<td>500</td>
<td>1000</td>
<td>10000</td>
</tr>
<tr>
<td>Local</td>
<td>N/A</td>
<td>350</td>
<td>700</td>
<td>7000</td>
</tr>
</tbody>
</table>

See Glossary of Terms for definitions of VPLPH, VPH and VPD.
* Vehicles Per Day (VPD) is the most comprehensive way to describe traffic volume on a given stretch of roadway.

The intended design of any given roadway will also dictate the type, degree and function of any intended traffic calming device.

Maintaining the intended function of any roadway is the ultimate goal of any traffic calming project, changing the character of any roadway will have long lasting effects on adjacent roadways and may do more harm to the traffic patterns in a neighbourhood than if nothing was changed at all.

This policy intends to deal with roads identified in the Official Plan as Local Roads, Class I and Class II Collector Roads. Though speed problems do exist on almost all roads, it is neither safe nor reasonable to place traffic calming on Arterial Roads. Because Arterial Roads are intended to facilitate higher traffic speeds and volumes, placing traffic calming devices on Arterial Roads may actually have a negative affect on adjacent residential streets.

Placing traffic calming on roads identified in the Official Plan as Arterial may result in an increase in cut through traffic and speeding on residential streets as people try to find short cuts or quicker paths to get to their destination and avoid the traffic calmed Arterial Road. This is the reason that the Canadian Guide to Neighbourhood Traffic Calming only deals with Local and Collector Roads.

### 4.2 Speed Reduction

A key component of most traffic calming devices is its ability to effectively reduce speed within a neighbourhood network. Acceptable speeds will vary depending on the characteristics of the roadway and adjacent land uses. Speed reduction is only necessary if the 85th percentile speed is a minimum of 10km/h or higher than the posted speed limit. The 85th percentile speed is the average speed
that 85\% of all traffic is traveling at. Use of the 85\textsuperscript{th} percentile speed is the industry standard for determining the extent of speeding problems.

4.3 Volume Reduction

Perceived traffic volume increases during peak times during the day often lead to the perception that a roadway is operating in a condition below its designed purpose. By using the Vehicles per day (VPD) number, we can avoid using peak hour snapshots that would skew overall volume results and provide a better basis for the road’s existing function. For each road classification there is a “threshold” volume limit that a road must meet to qualify for volume reduction traffic calming devices.

4.4 Pedestrian / Vehicle Safety

With traffic volume reduction and speed reduction comes an inherent increase in pedestrian and vehicular safety. Other specific calming measures can also increase pedestrian visibility and provide better places to cross roads. For instance, tying in a traffic calming measure that slows traffic with a pedestrian crossing will increase the safety of crossing pedestrians by forcing vehicles to slow down. Overall, pedestrian and cyclist traffic will be placed at a higher priority than that of regular vehicle traffic. It is important to remember that the public right of way must be shared between all modes of transportation, not just motorized vehicles. On all roads there must be a fair, safe and equitable balance between all road users to improve the overall safety of the road network for everyone.
5.0 Traffic Calming Warrants

Local Streets are assessed differently than Collector roads. Local roads are not intended for higher speeds or high volumes of vehicular traffic, therefore they are assessed separately from Collector Roads. Collector Roads are designed and designated to carry more volume at a higher speed than local roads. Though Local Roads experience similar problems to Collector Roads, there is a different expectation regarding the amount of traffic and type of traffic that a collector road is expected to handle. This can best be described by the presence of traffic signals and the increased width of collector roads.

The warrant scoring factors for Local and Class I / Class II Collector Roads include the evaluation of the following criteria:

- Excessive Speed
- Excessive Volume
- Bicycle Route
- Collisions
- Pedestrian Generators
- Residential Frontage

Each of these criteria break down further into a point system developed to better determine the need for various traffic calming devices. Using this evaluation system will accomplish the following things:

- An objective review of traffic problems on streets and in neighbourhoods
- A consistent policy throughout the City of Windsor to deal with traffic issues
- A problem statement identifying real problems as mandated by the Environmental Assessment Act
- A clear direction towards solutions for identified problems
- A definitive link between real identified problems and real solutions based on years of research by the Transportation Association of Canada.

A full explanation of how the warrant scoring system works can be found in Appendix A.
6.0 Traffic Calming Solutions for Existing Windsor Roads

Each traffic calming solution has been placed into various levels based on proven effectiveness in dealing with specific traffic problems. Local and Class I / Class II Collector roads are categorized differently, namely because of the limit to what type of traffic calming devices can be implemented on Collector Roads. The major difference between the two lists is in the use of vertical deflections eg: “speed humps”. Collector roads tend to carry larger amounts of traffic, are often times emergency and or transit routes and therefore the use of vertical deflections is discouraged because of safety issues.

The list of appropriate traffic calming solutions is based strictly on the effectiveness of the listed device. Though other traffic calming implements are listed in the Canadian Guide to Neighbourhood Traffic Calming, not all of them are applicable or in fact useful in the reduction of speed or volume or increasing public safety. Therefore, only those devices found to have a benefit to a neighbourhood have been included.

Using the point system developed based on the criteria in the warrant scoring system, we can determine what type of traffic calming devices are appropriate for a neighbourhood. Local Roads are broken down into 4 levels of traffic calming devices. Starting at Level 1, each level offers more progressively aggressive traffic calming measures. Likewise Collector Roads have 3 levels with each level offering more aggressive traffic calming measures. Please see Appendix F for images and further descriptions of each device listed below.

Local Roads:

<table>
<thead>
<tr>
<th>Level 1 Traffic Calming – Score 21&lt;36 Points (No EA Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Measures:</td>
</tr>
<tr>
<td>Signage, turn restriction signs, do not enter signs, one-way signs (no stop signs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2 Traffic Calming – Score 36&lt;56 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Measures:</td>
</tr>
<tr>
<td>Minor horizontal deflections such as: chicanes, lane narrowing, medians, on street parking, curb radius reductions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3 Traffic Calming – Score 56&lt;76 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Measures:</td>
</tr>
<tr>
<td>Horizontal deflections such as: chicanes, curb extensions, traffic circles.</td>
</tr>
<tr>
<td>Diversion measures such as: intersection channelizations, raised median islands through intersection, right in / right out islands (pork chops).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 4 Traffic Calming – Score 76&lt;Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Measures:</td>
</tr>
<tr>
<td>Vertical deflections such as: raised crosswalk, raised intersection, sidewalk extension, speed hump, textured crosswalk.</td>
</tr>
<tr>
<td>Diversion measures such as: directional closure, diverter, full closure.</td>
</tr>
</tbody>
</table>
### Class I and Class II Collector Roads:

<table>
<thead>
<tr>
<th>Level 1 Traffic Calming – Score 31&lt;46 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Measures:</td>
</tr>
<tr>
<td>Signage, turn restriction signs, speed limit signs, do not enter signs, one way signs (no stop signs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2 Traffic Calming – Score 46&lt;76 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Measures:</td>
</tr>
<tr>
<td>Horizontal deflections such as: chicanes, curb radius reduction, on street parking, lane narrowing, raised median islands.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3 Traffic Calming – Score 76&lt;Max Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Measures:</td>
</tr>
<tr>
<td>Horizontal deflections such as: curb extensions.</td>
</tr>
<tr>
<td>Diversion measures such as: intersection channelization, raised median through intersection, right in right out island*</td>
</tr>
</tbody>
</table>

* Diversion measures cannot affect the through movement of vehicles on a Collector Road, adjacent streets that intersect with Collector Road may have such devices placed on them.

The rationale behind these levels is to more appropriately deal with traffic problems based on their severity. Additionally, this level system better enables administration to determine what type of traffic calming measure will be appropriate to deal with a specific problem. The Canadian Guide To Neighbourhood Traffic calming lists each traffic calming device in terms of its effectiveness to deal with specific problems. Using that list enables us to suggest the most effective traffic calming device for the specific problem. A complete overview and list of the recommended devices based on these levels can be found in Appendix B.
7.0 Traffic Calming in New Neighbourhoods

Traffic Calming should be put in place in all new neighbourhoods. This traffic calming must be placed in accordance to the actual street classification in the Official Plan for the area. The designation of those streets will dictate the type of traffic calming devices that can be implemented.

Transportation Planning, through the Plan of Subdivision circulation will be responsible for commenting on traffic calming devices throughout new subdivisions. We ask that developers be proactive by showing the proposed location of all traffic calming devices to ensure that all departments have an opportunity to comment on the traffic calming devices proposed when the plan is circulated to all other city departments.

Generally, new neighbourhoods should incorporate traffic calming where it is reasonable to do so. In established areas, traffic calming will be implemented where an identified problem exists. In new neighbourhoods, there are usually no identified problems, however Administration may identify possible future opportunities for speeding, and cut through traffic as well as areas where enhanced pedestrian safety is required.

Plain and simple, traffic calming will be required throughout any new subdivision, no matter what size or shape, all streets must have some form of traffic calming on them. The Traffic Calming Policy expects the following traffic calming devices to be placed in new neighbourhoods:

- Roundabouts or traffic circles at all intersections between two local roads.
- Chicanes will be required on all roads where there are long straight sections (300 metres or more).
- Lane narrowings combined with pedestrian crossings where appropriate.
- Curb extensions are required at all intersections of Local and Collector Roads.
- Median islands should be used extensively throughout the neighbourhood to prevent cut through traffic between Collector and Local Roads where required.

These devices should be incorporated into the final design of the roadway and the cost be borne by the developer. The above traffic calming devices present no hardship to the developer in terms of cost because they all represent a reconfiguration of curbs and pavement alignment.

For further information regarding Traffic Calming in New Neighbourhoods please refer to Appendix C.
8.0 Public Participation And Study Process

The public will be encouraged to participate throughout a project. Installation or removal of Traffic Calming measures falls under Schedule B and Schedule C projects under the Municipal Class Environmental Assessment. The public will be kept updated via direct mail, newspaper notices, and public meetings that will be held throughout the project. This public involvement will strictly follow the Municipal Class EA process.

8.1 Respond To Public Initiatives

- Resident(s) will contact Public Works – Transportation Planning or their respective Council member.
- Administration will perform the warrant study.

8.2 Warrant Study

- Warrant study will identify streets, intersections and neighbourhood areas that could be a part of the traffic-calming project based on administration’s recommendations.
- Study may follow boundaries such as physical landforms (river) and collector arterial roadways, railway right of ways and Ward boundaries.
- Public Works – Transportation Planning will study the selected road sections and determine what type of traffic calming measures are warranted based on the scoring mechanism.

8.3 After Completion Of Warrant Study

- If warrant study indicates that improvements are not necessary, then the requestor and Council members will be notified by mail indicating that the warrants are not met and that no identifiable problem exists and therefore traffic calming measures are not required.
- If warrant study finds that area streets require some form of traffic calming a petition will be prepared by Public Works – Transportation Planning and sent to the requestor for circulation to gauge community support. **

8.4 Petition Circulation

- If warrant study identifies a need for traffic calming devices, the public will be notified of the study results and asked to return a mail out petition.
- Public Works – Transportation Planning will determine the area required for the mail out.
- The public must approve the initiation of this study by showing signature support of 66% or more of the residences measured by a 40% mail out response.
- If less than 66% of the affected residents approve of the study initiation, then the study will stop.
• If 66% or more of the affected residents do support the study, then the process will continue.
• If the public approves of the study then:
  o Emergency services, Public Works and Transit Windsor and all other necessary departments will be notified of the traffic calming study.
  o The information will note the possible traffic calming devices that have been identified in the warrant study and the roads that may have certain devices applied.
  o Public Works – Transportation Planning will hold a meeting and request that the departments provide comments on specific services that could be affected on the identified streets / neighbourhood.
  o Public Works – Transportation Planning will request service maps of all affected departments for later public meeting use. (ie: emergency routes, refuse collection route plan / recycle collection route plan, winter control plan, Transit Windsor bus routes Specific to the area being studied.)

8.5 Public Meeting Requirements

• Administration will evaluate potential costs of a traffic calming plan to determine the number of public meetings based on the EA process **.
• Public notification of the upcoming meeting will take place according to Municipal Class EA process:
  o Notices in the local newspaper will be placed (Notice of study commencement and notice of public information session)
• The preliminary public meeting is recommended for affected property owner input.

8.6 Preliminary Meeting

• Traffic calming options dictated by the warrant study will be presented to the public.
• Other affected City Departments (ie: Transit Windsor, Public Works – Refuse Collection, Public Works – Winter Control, Emergency Services, Building and Development, and Planning) will be invited to answer questions and to ensure a good administrative presence.
• Other affected agencies (ie: WAAC, Cycling Committee etc.) will also be invited to provide comments and feedback.
• Each affected street will be clearly identified displaying potential traffic calming options based on warrant study score.
• No actual Traffic Calming devices will be portrayed on the streets, but rather, the individual devices will be displayed on separate boards showing the various levels of traffic calming devices with pictures and costs.
• Surveys and information will be collected and we will encourage further public input for the length of the project.
8.7 Preparation Of Alternatives

- Based on information collected at the preliminary meeting, Administration will prepare and study alternatives that both follow the Traffic Calming Policy and incorporate public suggestions.
- Alternative options will be circulated amongst affected City Departments for comments and suggestions.

8.8 Selection Of Recommended Design

- Administration will select the most appropriate designs for the traffic calming project and will circulate the final design with affected city departments.
- Changes and suggestions based on the final design will be made.

8.9 Public Meeting 2

- The recommended design will be displayed.
- Other affected City Departments will also be invited to answer questions and to ensure a good Administrative presence.
- The estimated cost of the recommended option will also be displayed to give Council a better understanding of the funding requirements.

8.10 Recommend Design and Council Approval For Funding

- Members of the public will be notified of the upcoming Council meeting and the issue that will be addressed via:
  o Notices in the local newspaper will be placed
  o Notices on the City of Windsor Web Site will also be posted.
  o Letters to interested residents will also be sent notifying them of the upcoming meeting. The list will be compiled from the sign-in sheet at the previous public meeting.
- Council will be asked to include the funding in the capital works budget.
- At this point no changes can be made to the recommended design.
- Approving only part of the recommended plan or a few Traffic Calming devices will defeat the purpose of the entire project and will result in its failure and therefore Traffic Calming plan must be approved as a whole project.

* NOTE: If it is found that only Level 1 Traffic Calming devices are required for any given section of roadway, then Administration will implement the signage improvements where necessary.

** NOTE: Traffic Calming projects typically fall under Class ‘B’ of the Municipal Class EA Planning and Design Process (Projects under $1.5 million). Projects with a projected cost higher than $1.5 million will fall under a Class C EA.
9.0 Recommendations And Conclusions

9.1 Warrants And Study Methodology

There are three major components that are necessary in order to make the traffic calming policy work most effectively:

- An objective warrant study system and subsequent policy to evaluate the need for traffic calming in existing neighbourhoods.
- An objective comprehensive plan to implement consistent and effective traffic calming in new neighbourhood designs.
- Supportive text in the Official Plan for traffic calming in both existing neighbourhoods and new subdivisions.

Therefore, in order to meet those objectives we recommend that the following provisions be approved.

- To study the need for Traffic Calming in existing neighbourhoods by employing the prescribed Warrant Scoring system in Appendix A developed for use in the City of Windsor to quantify traffic issues and to prioritize traffic calming projects.
- The study of Traffic Calming be on a neighbourhood basis and further that no ad hoc traffic calming measures be constructed without a full transportation evaluation of the entire neighbourhood based on the Traffic Calming Policy.
- To use Traffic Calming measures according to the levels prescribed in Appendix B Figure 2 for Local Roads and in Appendix B Figure 3 for Class I / Class II Collector Roads.
- That no vertical deflections (Speed Humps etc.) be placed on emergency routes or transit routes.
- The implementation of Traffic Calming in new neighbourhoods based on the criteria outlined in Appendix C to prevent future traffic problems by proactively installing Traffic Calming devices during construction of new subdivisions.
- The additional supportive text outlined in Appendix D for inclusion in the Official Plan.

9.2 Further Studies Needed

The review of a potential Traffic Calming Policy for the City of Windsor has raised many important issues regarding sustainable transportation and the role of pedestrians and cyclists in neighbourhoods. Unfortunately, these pedestrian oriented development issues cannot be effectively dealt with through a traffic
calming policy alone. One of the most important reasons for traffic calming is the safety of all other modes of transportation including bicycling and walking. Traffic Calming can bring about safer streets in neighbourhoods, however Traffic Calming does not directly translate to pedestrian and cyclist supportive urban design and planning.

Transportation Planning does see the merit in improving neighbourhoods to foster sustainable modes of transportation and encourages more pedestrian and cyclist oriented neighbourhood design. Transportation Planning therefore recommends that additional studies be undertaken in order to review the possibility of encouraging more pedestrian oriented developments to take advantage of traffic calming to bring about a more pedestrian focus in our neighbourhoods. Therefore, Transportation Planning recommends the following:

- A future report be drafted by the Planning Department – Urban Design section on encouraging pedestrian friendly neighbourhood design and potential improvements to existing neighbourhoods to facilitate an increased reliance on sustainable transportation through urban design.

9.3 Human Resources And Equipment Requirements

Studying the need for traffic calming is time consuming and requires specialized equipment. The Public Works – Transportation Planning division has some of the required equipment but in order to adequately perform existing duties and keep up with the evaluation of neighbourhood traffic patterns there will be a need for additional Traffic Counting devices. In addition to our current inventory of counting devices, we will require 6 additional units capable of counting both traffic volume and speed. These additional units will enable us to deploy them throughout a neighbourhood and leave them there for a week in order to get an accurate representation of traffic volumes and speeds. It is expected that these 6 sets of “tubes” will enable us to collect data in an entire neighbourhood in approximately one month’s time.

Transportation Planning does keep records of traffic volumes on all Arterial and Collector Roads in the City, however in order to study the need for traffic calming, traffic volume counts need to be performed on a much more intense scale and need to be the most up to date available. In order to complete a study of a neighbourhood, Transportation Planning will be required to evaluate almost all streets in a given neighbourhood including local roads. Therefore it is important that we have adequate equipment to collect the required data needed for the evaluation.

Human resources and time is an additional aspect. Our current staff levels are such that existing staff will not be able to perform these studies in a timely fashion. It is estimated that the Transportation Planning Department will require an additional staff member to perform not only the warrant studies but also follow through with the lengthy Environmental Assessment Process which can take up to and beyond one year to complete. Public Works – Transportation Planning is requesting direction from PAC and subsequently City Council regarding the
number of Traffic Calming projects they would like to see conducted in a year. Based on our early estimates we expect that with one additional staff member we can complete 4 to 6 traffic calming evaluations per year and 2 Environmental Assessments. Without an additional staff member we will not be able to complete any traffic calming evaluations. Therefore in order for us to effectively study the need for traffic calming, we will require at least one additional staff member to perform the additional work.

One of the most fundamental issues that our Department faces is the lack of predictability regarding the number of neighbourhoods that will meet the warrants. Therefore, if there are more than 2 neighbourhoods that meet the needs for traffic calming, we will have to delay the remaining Environmental Assessments until subsequent years because of staff availability.

Public Works – Transportation Planning therefore recommends the following:

- The purchase of 6 new traffic volume and speed counting tubes for use by the Transportation Planning Department to help collect data for Traffic Calming at a Cost of Approximately $10494.00

- The hiring of one additional Transportation Planner to work on traffic calming projects, collecting data, assembling reports and undertaking Environmental Assessments.

9.4 Conclusion

The Public Works – Transportation Planning Department is very excited about moving forward with this policy to help bring about real traffic calming solutions in neighbourhoods in the City of Windsor.
10.0 Appendices

Appendix A Traffic Calming Warrant Scoring System

The traffic calming warrant scoring is designed to create a strict quantitative measure of the traffic issue on a given street. These warrants are also intended to ensure that the problem that exists is being dealt with via use of approved traffic calming devices appropriate for dealing with that particular problem. The basic premise for this is to ensure that speed reducing traffic calming measures are not constructed with the intention to reduce traffic volume levels and vice versa. Therefore, the following scoring system is designed to quantitatively assess the severity of the problem and thus better guide Administration to the most appropriate traffic calming solution. The Canadian Guide to Neighbourhood Traffic Calming recommends that traffic calming plans strictly quantify the problems in order to find the best solution to the problem:

“Quantify problems. Based on an analysis of the collected data, quantify the magnitude of reported problems (e.g. the number of vehicles per hour or per day), the duration of the problem (e.g. peak periods or all-day), the direction and route of traffic, and any other key characteristics. This information will be used to identify potential traffic calming measures, and to justify the need for measures to persons who might oppose the traffic calming plan.” (Canadian Guide to Neighbourhood Traffic Calming)

It is important to remember, though we are studying individual streets to determine if they meet the warrants, any traffic calming program will be a part of a neighbourhood traffic management plan. As such, traffic calming should never and will never be implemented on a street by street basis in any given neighbourhood.

It is the intention of this policy to deal with traffic calming on a neighbourhood basis only, not as an ad hoc solution for individual streets.

In order to properly quantify the need for traffic calming a number of different criteria should be reviewed and data should be collected. In some municipalities they have limited these criteria to only a few key items. It is administration’s belief that having such a small number of traffic only related criteria does not reflect the true nature or need for traffic calming and as such has expanded the criteria far more than any other municipality. Similar to the Town of Oakville, the proposed policy for the City of Windsor plans to review 6 different criteria items to determine the need for traffic calming. Below is a list of those criteria:

- Excessive speed
- Excessive volume
- Bicycle routes
- Collisions
- Pedestrian Generators
- Residential Frontage
Local Road Traffic Calming Warrants

Local Streets are assessed differently than collector roads. Local roads are not intended for higher speeds or high volumes of vehicular traffic, therefore they are assessed separately from Collector Roads.

The warrant scoring factors for local roads follow:

a) Excessive Speed
Speeding on roadways, either intermittent or otherwise can be quantified by calculating the 85\textsuperscript{th} percentile speed, which is the accepted method in identifying excessive speed problems. When 85\textsuperscript{th} percentile speeds are equal to or in excess of the posted or statutory speed limit by 10km/h then the respective street section is given a score based on both achieving that benchmark and kilometers per hour above that benchmark. The 85\textsuperscript{th} percentile speed figure is an industry standard for assessing speeding problems on roadways. A speed problem exists when the 85\textsuperscript{th} percentile speed is 10km/h or more over the posted limit.

85\textsuperscript{th} percentile speed = 10km/h or more over speed limit
10 points = 85\textsuperscript{th} percentile speed is 10km/h over the speed limit
11 points = 85\textsuperscript{th} percentile speed is 11km/h over the speed limit
12 to a max of 20 points

b) Excessive Volume
It is important to note that people have different expectations about how much volume a particular class of street should handle. Though the public may perceive that a volume problem exists, we must use the approved WALTS guidelines to determine actual expected volumes in order to quantify a problem. Traffic volumes vary considerably during different times of day and different days of the week. Because of these fluctuations, traffic volume is calculated based on an entire day of counts averaged out over a week to determine actual average vehicle per day volume. Fresh, up to date counts will be used to determine the warrant when a study is initiated. For the best results, these counts should take place during the school year reflecting the higher traffic during those times. Using WALTS, the expected traffic volumes are expressed as the “Threshold”. Traffic counts above this threshold are scored based on the exact quantity above and beyond the expected volume.

<table>
<thead>
<tr>
<th>Road</th>
<th>Road Type</th>
<th>VPD (Typical Maximum)</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>N/A</td>
<td>7000</td>
<td>3000*</td>
</tr>
</tbody>
</table>

12 points for reaching threshold
2 points / 500 VPD above threshold to a maximum of 20 points total
*Expected Maximum Traffic Volume based on survey of other jurisdictions and analysis of traffic volumes on local roads in Windsor.

c) Bicycle Route
If the roadway has on street bicycle lanes, or is designated as an on street bicycle route the score is added. Strict following of the Bicycle Use Master Plan (BUMP)
document is required to determine the actual designation of a selected roadway. Bicycle lanes require special modifications in order for them to be safely accommodated with many traffic calming devices. 10 points for a bicycle route/lane.

d) Collisions
Administration will use accidents reported to Windsor Police Services. Unreported accidents or near misses do not and cannot be counted because there is no way to tabulate them. Because road segments vary in length, a figure of average collisions per kilometer will be used. Each accident will count the same whether it involves a vehicle or a pedestrian. Because accidents are not rated on severity, there will be no extra points awarded for more serious accidents because all accidents may point to a serious problem, not just the ones that cause injuries. The number of accidents will be tallied over a 3 year period and the total number of accidents will be used to determine point levels.
0 accidents per km = 0 Points
0 > 1 accidents per km = 5 Points
1 > 3 accidents per km = 10 Points
3 > accidents per km = 15 Points
To a maximum of 15 points

* Please Note: For the purposes of the warrant study, these accidents will be looked at only to count them to meet the warrants. Regardless of the warrants, if a neighbourhood meets the need for a traffic calming Environmental Assessment, all accidents will be reviewed in depth to determine what remediation measures can be put in place to reduce or eliminate specific accident types.

e) Pedestrian Generators
Each occurrence of any one of these particular pedestrian generators will result in a score. It can be argued that almost every land use is a pedestrian generator, however we can only include some types of key land uses that draw the majority of pedestrians. Multiple uses along a specific segment of street will register multiple points. For instance, a high school, with a church and a park along a street would get a score of 12 points.
Parks = 5
Elementary School = 5
High School = 4
University = 3
Religious Building = 3
Community Centre / Library = 3
Neighbourhood Commercial = 3
To a maximum of 15

f) Total Percentage Of Residential Frontage
Residential uses tend to generate the most concerns over traffic calming. Therefore, based on the total residential frontage on both sides of the street a score will be calculated. The goal is to ensure that purely residential streets get the priority for traffic calming, as opposed to a commercial corridor. Commercial corridors are typically located on either Collector or Arterial Roads.
Commercially fronted Collector Roads may have some forms of traffic calming, however it is recommended that they be incorporated into various streetscaping implements and reviewed at a later time in conjunction with Urban Design. A number of traffic calming devices may have an adverse affect on commercial frontage visibility or access issues that these corridors require and should be reviewed on a case-by-case basis or in an additional policy/study.

100% = 10 Points  
90% = 9 Points  
80% = 8 Points  
70% = 7 Points  
60% = 6 Points  
50% = 5 Points  
40% = 4 Points  
30% = 3 Points  
20% = 2 Points  
10% = 1 Point  
0% - 0 Points  
Max Total = 90

Collector Road Traffic Calming Warrants*

Collector Roads are designed and designated to carry more volume at a higher speed than local roads and therefore will be scored differently. Though Local Roads experience similar problems to Collector Roads, there is a different expectation regarding the amount of traffic and type of traffic that a collector road is expected to handle. This can best be described by the presence of traffic signals and the increased width of collector roads. Warrant scoring factors for collector roads follow:

*Scenic Drives: The only Scenic Drive that exists currently in the City of Windsor is Riverside Drive. At present, Riverside Drive functions as both an Arterial type road (4 lane section) and a Collector type road (2 lane sections). An Environmental Assessment of the entire Riverside Drive corridor is pending and may include recommendations for traffic calming solutions.

a) Excessive Speed

Speeding on roadways, either intermittent or otherwise can be quantified by calculating the 85th percentile speed, which is the accepted method in identifying excessive speed problems. While at times, people may observe people traveling at higher rates of speed, we must use the 85th percentile speed to quantify the actual speed problem on a road. When 85th percentile speeds are equal to or in excess of the posted or statutory speed limit by 10km/h then the respective street section is given a score based on both achieving that benchmark and if speeds continue above that benchmark.

85th percentile speed = 10km/h or more over speed limit
10 points = 85th percentile speed is 10km/h over the speed limit
11 points = 85th percentile speed is 10km/h over the speed limit
12 points = 85th percentile speed is 10km/h over the speed limit
to a max of 20 points
b) Excessive Volume
Collector roads are intended to carry a greater amount of volume than a local road. Though people may perceive that their respective Collector Road carries an excessive amount of volume, the Official Plan and WALTS mandate the function of any road. The Official Plan defines collector roads as the following:

Collector Roads shall be designed to carry moderate volumes of passenger traffic, except in industrial areas where they may carry passenger and commercial traffic, between Local Roads, Class II Collector Roads and Class I and Class II Arterial Roads at low to moderate speeds;

Those moderate volumes are found below as identified by WALTS as the VPD or Vehicle Per Day maximum. Class I collectors expect a maximum volume of 13000 vehicles and Class II collectors expect a maximum volume of 10000 vehicles. The threshold that has been established for this policy is at a much lower volume than those listed in WALTS. Though neighbouring residents may object to the designation of these roads and their intended function, it is not in the scope of this document to change or alter the Official Plan designation of any road within the City of Windsor.

<table>
<thead>
<tr>
<th>Road</th>
<th>Road Type</th>
<th>VPD (Typical Maximum)</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector</td>
<td>Class I</td>
<td>13000</td>
<td>9000</td>
</tr>
<tr>
<td></td>
<td>Class II</td>
<td>10000</td>
<td>6000</td>
</tr>
</tbody>
</table>

12 points for reaching threshold
2 points / 500 VPD above threshold to a maximum of 20 points total

c) Bicycle Route
If the roadway has on-street bicycle lanes, or is designated as an on street bicycle route the score is added. The Bicycle Use Master Plan will be used to determine the type of cycling facility on any given road. Bicycle lanes require special modifications in order for them to be safely accommodated with many traffic calming devices. It is more likely that a collector road will have a bicycle lane than a local road.
10 points for a bicycle route/lane.

d) Collisions
Administration will use accidents reported to Windsor Police Services. Un-reported accidents or near misses do not and cannot be counted because there is no way to tabulate them. Because road segments vary in length, a figure of average collisions per kilometer will be used. Each accident will count the same whether it involves a vehicle or a pedestrian. Because accidents are not rated on severity, there will be no extra points awarded for more serious accidents because all accidents may point to a serious problem, not just the ones that cause injuries. The number of accidents will be tallied over a 3 year period and the total number of accidents will be used to determine point levels.

0 accidents per km = 0 Points
0 > 1 accidents per km = 5 Points
1 > 3 accidents per km = 10 Points
3 > ~ accidents per km = 15 Points
To a maximum of 15 points

* Please Note: For the purposes of the warrant study, these accidents will be looked at only to count them to meet the warrants. Regardless of the warrants, if a neighbourhood meets the need for a traffic calming Environmental Assessment, all accidents will be reviewed in depth to determine what remediation measures can be put in place to reduce or eliminate specific accident types.

e) Pedestrian Generators:
Each occurrence of any one of these particular pedestrian generators will result in a score. It can be argued that almost every land use is a pedestrian generator, however we can only include some types of key land uses that draw the majority of pedestrians. Multiple uses along a specific segment of street will register multiple points. For instance, a high school, with a church and a park along a street would get a score of 12 points.
Parks = 5
Elementary School = 5
High School = 4
University / College = 3
Religious Building = 3
Community Centre / Library = 3
Neighbourhood Commercial = 3
To a maximum of 15

f) Total Percentage Of Residential Frontage
Residential uses tend to generate the most concerns over traffic calming. Therefore based on the total residential frontage on both sides of the street a score will be calculated. The goal is to ensure that purely residential streets get the priority for traffic calming, as opposed to a commercial corridor. Commercial corridors are typically located on either Collector or Arterial Roads. Commercially fronted Collector Roads may have some forms of traffic calming, however it is recommended that they be incorporated into various streetscaping implements and reviewed at a later time in conjunction with Urban Design as a number of these devices may not take into account the visibility or access issues that these corridor’s require and should be reviewed on a case by case basis.
100% = 10 Points
90% = 9 Points
80% = 8 Points
70% = 7 Points
60% = 6 Points
50% = 5 Points
40% = 4 Points
30% = 3 Points
20% = 2 Points
10% = 1 Point
0% - 0 Points
Appendix B Traffic Calming Solutions For Windsor Roads

Level Of Traffic Calming Based On Score: Local Roads

Local road scores will be applied to this chart that identifies which level of traffic calming will be appropriate for each roadway. The intention of this chart is to ensure that more restrictive forms of traffic calming are implemented on roadways with more severe problems. Likewise, more simple forms of traffic calming can be placed on roadways with less severe problems.

No Traffic Calming Necessary = 0 < 21
Level 1 Traffic Calming = 21 < 36
Level 2 Traffic Calming = 36 < 56
Level 3 Traffic Calming = 56 < 76
Level 4 Traffic Calming = 76 < Max

Appropriate Traffic Calming Measures For Local Roads

Figure 2 presents the acceptable traffic calming measures for the various levels of traffic problems. The solutions range from simple signage in Level 1 Calming all the way to Level 4 Calming, which could include complete closure of a roadway’s entrance or exit. It is important to note that if a road scores for a higher level, lower level traffic calming devices can be applied in conjunction with what is available in the higher level. Depending on the type of problem, the proven effect of each device is listed to provide a better guide as to the best solution(s) for the particular street. The reference column displays a code that references another chart in Appendix F Figure 5. This chart is designed to give the reader an image and a more in depth text description of the traffic calming devices.
(3, Canadian Guide to Neighbourhood Traffic Calming) Chart information regarding the effect of each traffic calming device on various issues ie: Speed Reduction based on research conducted by ITE and included in the ITE Canadian Guide to Neighbourhood Traffic Calming.

**NOTE:** All devices listed above are approved for use in the Province of Ontario and are designed and signed according to the Ontario Traffic Manual.
Level Of Traffic Calming Based On Score: Collector Roads

Traffic Calming on collector roads presents a different challenge. Collector roads are intended to carry more traffic at slightly higher speeds. An important difference between the available traffic calming devices for Collector roads in comparison to Local roads is that vertical deflections have been completely removed because of safety hazards and conflicts with Transit, Emergency and Public Works service vehicles. Likewise, obstructions or major diversions of any type are absent from the available traffic calming devices for collector roads. Going back to the intention of traffic calming, which is to return the road and traffic conditions to their intended use, obstructing Collector roads changes the road’s use and can present more problems than if nothing was changed on the roadway at all. However, obstructions and major diversions can be employed on adjacent local roads at intersections, so long as through traffic on the Collector road can proceed through the intersection.

No Traffic Calming Necessary = 0 < 31
Level 1 Traffic Calming = 31 < 46
Level 2 Traffic Calming = 46 < 76
Level 3 Traffic Calming = 76 < Max

Appropriate Traffic Calming Measures For Collector Roads

Figure 3 displays a similar chart to what was shown for Local roads. There are 3 separate levels of traffic calming that can be implemented on a collector road. The same rules apply regarding their possible implementation and that is that if Level 2 traffic calming is warranted, then all available items in Level 1 as well as Level 2 can be used to alleviate the problem. Like the previous chart, the reference column displays a code that references another chart in Appendix F Figure 5. This chart is designed to give the reader an image and a more in-depth text description of the traffic calming devices.
### Level 1 Calming – Score 31<46

<table>
<thead>
<tr>
<th>Measure</th>
<th>Signing</th>
<th>Speed Reduction</th>
<th>Volume Reduction</th>
<th>Conflict Reduction</th>
<th>Environment</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Speed</td>
<td>Minor</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>S-1</td>
</tr>
<tr>
<td>Right of Left Turn Prohibited</td>
<td>Nil</td>
<td>Minor</td>
<td>Minor</td>
<td>Minor</td>
<td>Minor</td>
<td>S-2</td>
</tr>
<tr>
<td>Through Traffic Prohibited</td>
<td>Nil</td>
<td>Minor</td>
<td>Minor</td>
<td>Minor</td>
<td>Minor</td>
<td>S-3</td>
</tr>
<tr>
<td>Passive Signage (ie: Traffic Calmed Neighbourhood)</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Minor</td>
<td>Minor</td>
<td>S-4</td>
</tr>
</tbody>
</table>

### Level 2 Calming – Score 46 < 76

<table>
<thead>
<tr>
<th>Measure</th>
<th>Horizontal Deflection</th>
<th>Speed Reduction</th>
<th>Volume Reduction</th>
<th>Conflict Reduction</th>
<th>Environment</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicane - Two Lane</td>
<td>Minor</td>
<td>Nil</td>
<td>Minor</td>
<td>Minor</td>
<td>Minor</td>
<td>H-1</td>
</tr>
<tr>
<td>Curb Radius Reduction</td>
<td>Minor</td>
<td>Nil</td>
<td>Nil</td>
<td>Minor</td>
<td>Minor</td>
<td>H-2</td>
</tr>
<tr>
<td>On Street Parking</td>
<td>Minor</td>
<td>Nil</td>
<td>Nil</td>
<td>Minor</td>
<td>Minor</td>
<td>H-3</td>
</tr>
<tr>
<td>Lane Narrowing</td>
<td>Minor</td>
<td>Nil</td>
<td>Nil</td>
<td>Minor</td>
<td>Minor</td>
<td>H-4</td>
</tr>
<tr>
<td>Raised Median Island</td>
<td>Minor</td>
<td>Nil</td>
<td>Minor</td>
<td>Nil</td>
<td>Nil</td>
<td>H-5</td>
</tr>
</tbody>
</table>

### Level 3 Calming – Score 76 < Max

<table>
<thead>
<tr>
<th>Measure</th>
<th>Horizontal Deflection</th>
<th>Speed Reduction</th>
<th>Volume Reduction</th>
<th>Conflict Reduction</th>
<th>Environment</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curb Extension</td>
<td>Minor</td>
<td>Nil</td>
<td>Nil</td>
<td>Substantial</td>
<td></td>
<td>H-7</td>
</tr>
<tr>
<td><strong>Diversion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intersection Channelization</td>
<td>Nil</td>
<td>Minor</td>
<td>Minor</td>
<td>Minor</td>
<td></td>
<td>O-1</td>
</tr>
<tr>
<td>Raised Median Through Intersection</td>
<td>Nil</td>
<td>Substantial</td>
<td>Minor</td>
<td>Minor</td>
<td></td>
<td>O-2</td>
</tr>
<tr>
<td>Right in / Right out Island</td>
<td>Nil</td>
<td>Substantial</td>
<td>Minor</td>
<td>Minor</td>
<td></td>
<td>O-3</td>
</tr>
</tbody>
</table>

(3, Canadian Guide to Neighbourhood Traffic Calming)

* Collector roads themselves cannot be obstructed, but the local roads that intersect them can have obstructing traffic calming measures.

NOTE: All devices listed above are approved for use in the Province of Ontario and are designed and signed according to the Ontario Traffic Manual.
Appendix C Traffic Calming In New Neighbourhoods

Traffic Calming should be put in place in all new neighbourhoods. This traffic calming must be placed in accordance to the actual street classification in the Official Plan for the area. The designation of those streets will dictate the type of traffic calming devices that can be implemented.

Generally, new neighbourhoods should incorporate traffic calming where it is reasonable to do so. In established areas, traffic calming will be implemented where an identified problem exists. In new neighbourhoods, there are usually no identified problems, however Administration may identify possible future opportunities for speeding, and cut through traffic as well as areas where enhanced pedestrian safety is required.

Recommended Devices For New Neighbourhoods

The required devices for new neighbourhoods will be based on road classification and will follow the approved devices for those same roads. For instance, all of the items listed under local roads will be available for use on the local roads of a new subdivision, based on the recommendations of administration. Likewise, the same goes for Collector Roads identified. In all cases the placement of these devices will be discussed openly with other potentially affected departments. Vertical deflections will not be used in new neighbourhoods. Because vertical deflections should only be employed in cases where severe traffic problems exist, and in new neighbourhoods traffic problems are not yet present, it would be premature to place speed humps. However it is expected that the other horizontal deflections that will play an integral role in new subdivisions will prevent traffic problems before they grow to the point where speed humps are necessary.

If we design neighbourhoods properly at the start, then the need for more severe traffic calming measures will be negated.

The design of all traffic calming devices will address all road users and in no way impede the movement of pedestrian or cyclist traffic. As a result, all devices will be constructed to be pedestrian and cyclist friendly. Pedestrian and cyclist traffic will be placed at a higher priority than that of regular vehicle traffic. Collector Roads will have a more free flowing design to facilitate transit services and emergency services but will be required to have some forms of acceptable traffic calming devices.

As a general rule, Transportation Planning will be looking for all developers to act proactively regarding the placement of approved traffic calming devices throughout the plan of subdivision. Specifically, we will be looking for extensive use of the following measures:

- Roundabouts or traffic circles where Local Roads intersect is a must, intersections between Local Roads and Collector Roads should not have traffic circles, but should have curb extensions and special sidewalk treatments.
• Chicanes will be required throughout any subdivision plan where there are long straight sections of roadway, one lane chicanes can be located on Local Roads, and two lane chicanes are acceptable both on Collector and Local Roads.
• Lane narrowings combined with pedestrian crossings at crucial locations where pedestrians may cross to utilize parks, or other pedestrian generators are required on both Local and Collector Roads.
• Curb extensions are required at all intersections of Local and Collector Roads, unless it is found that the effects to Transit Service or Emergency Services will be too great.
• Median islands should be used extensively throughout all neighbourhood designs especially on Collector Roads and at key locations on Local Roads.
• Median islands should also be used at key locations to prevent nearby traffic from utilizing local roads as short cuts. This can be achieved by placing medians at intersections with local roads where short-cutting may be a future problem.

These traffic calming aspects should be incorporated as a rule, rather than an exception in all new subdivisions, regardless of size or location in the city. This includes areas where lots and right of ways have already been designated.

It is important to note that Transportation Planning will not be requesting vertical deflections in new subdivisions because of their inherent safety issues. It is the intention of this policy to reduce potential traffic problems in new neighbourhoods through careful design and placement of horizontal deflections.

**Who Is Responsible For The Cost?**

Traffic calming in new neighbourhoods is quite cheap in comparison to retro-fit situation in existing neighbourhoods. More or less, in new neighbourhoods traffic calming is merely the same road, constructed somewhat differently. Typically, only minor extra costs will be incurred during the design stage and in the amount of concrete curbing. These costs are not onerous and in fact result in a more attractive neighbourhood for residents. Therefore, it is expected that developers will not have concerns regarding the construction of these devices in a new subdivision as it can be portrayed as an attractive feature that people would be interested in having in their neighbourhood.
Appendix D Additional Supportive Text In The Official Plan

The inclusion of supportive wording in the Official Plan, referencing the Traffic Calming Policy will enable this policy to be applied in a more effective manor, especially in the design of new neighbourhoods. Though most policies of this nature are stand alone traffic policies, the inclusion of supportive statements in the Official Plan gives the policy more backing, especially in terms of new residential developments. Making traffic calming a mandatory part of a subdivision’s road network design is an integral step in pre-empting traffic problems in neighbourhoods. Therefore transportation planning is working with the Planning Policy group to include the following statements in the Official Plan regarding traffic calming.

Section 7 Infrastructure
New – Traffic Calming 7.2.1.16 To support the inclusion of traffic calming devices according to the Traffic Calming Policy

New – Balanced Transportation System 7.2.2.6 f) Implementing traffic calming devices in existing neighbourhoods and requiring traffic calming in new neighbourhoods consistent with the Traffic Calming Policy

Pedestrian Network Policies
New – Pedestrian Movement 7.2.3.1 e) require that all new residential subdivisions incorporate traffic calming consistent with the Traffic Calming Policy to promote pedestrian safety in residential neighbourhoods.

Road Network Policies
New - Class I Collector Roads 7.2.6.6 b) vi) Class I Collector Roads are subject to traffic calming where it has been determined that there is a traffic problem. All Traffic Calming will be in accordance with a neighbourhood transportation management plan and consistent with the terms and conditions in the Traffic Calming Policy.

New – Class II Collector Roads 7.2.6.7 b) vi) Class II Collector Roads are subject to traffic calming where it has been determined that there is a traffic problem. All Traffic Calming will be in accordance with a neighbourhood transportation management plan and consistent with the terms and conditions in the Traffic Calming Policy.

New – Local Roads 7.2.6.8 b) vi) Local Roads are subject to traffic calming where it has been determined that there is a traffic problem. All Traffic Calming will be in accordance with a neighbourhood transportation management plan and consistent with the terms and conditions in the Traffic Calming Policy.

New – Residential Areas 7.2.6.14 e) Requiring that Traffic Calming devices be included in the road design of any new residential subdivision in accordance with the Traffic Calming Policy.

New – Residential Areas 7.2.6.14 f) Applying the principals of the Traffic Calming Policy to existing roads in residential areas by ensuring that Traffic
Calming is placed as a part of a neighbourhood traffic management plan, and that it is placed where it is required and identified through the comprehensive study of the roads outlined in the Traffic Calming Policy.

New – Traffic Calming in New Residential Subdivisions 7.2.6.16 Council shall require that all new residential subdivisions include traffic calming measures as an integral part of the road design. Administration will recommend appropriate traffic calming devices in all new subdivisions.

a) Traffic Calming devices must enhance all non-vehicular modes of travel and will take into account pedestrian movements and will encourage safe bicycle operation throughout.

b) Traffic calming devices will follow the provisions within the Traffic Calming Policy for new subdivisions and generally will follow the list of guidelines below:

i) Intersections between two Local Roads must utilize roundabouts or traffic circles.

ii) Curb extensions are required at all intersections of Local and Collector Roads, unless it is found that they will have an adverse effect on Transit Service or Emergency Services.

iii) Special sidewalk treatments should be incorporated at all intersections.

iv) Long straight-aways within subdivisions must be avoided, thus chicanes will be required throughout any subdivision plan where there are long straight sections of roadway. One lane chicanes can be located on Local Roads, two lane chicanes are acceptable on Class I / Class II Collector Roads and Local Roads.

v) Mid-block pedestrian crossings must include lane narrowings. These crossings should be placed at locations where pedestrians may cross to utilize parks, schools, neighbourhood commercial establishments or other pedestrian generators. Lane narrowings are required on both Local and Collector Roads.

vi) Median islands must be used extensively throughout all neighbourhood designs especially on Collector Roads and at key locations on Local Roads.

vii) Median islands should also be used at key locations to prevent nearby traffic from utilizing local roads as short cuts. This can be achieved by placing medians at intersections with local roads where short-cutting may be a future problem.
### Signing

<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>MEASURE</th>
<th>ESTIMATED INSTALLATION COST 2005 Canadian Dollars</th>
<th>FACTORS AFFECTING COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>Maximum Speed</td>
<td>$120 - $240 per sign</td>
<td>Number of signs required</td>
</tr>
<tr>
<td>S-2</td>
<td>Right/Left Turn Prohibited</td>
<td>$120 - $240 per sign</td>
<td>Number of signs required</td>
</tr>
<tr>
<td>S-3</td>
<td>Through Traffic Prohibited</td>
<td>$120 - $240 per sign</td>
<td>Number of signs required</td>
</tr>
<tr>
<td>S-4</td>
<td>Traffic Calmed Neighborhood</td>
<td>$120 - $240 per sign</td>
<td>Number of signs required</td>
</tr>
</tbody>
</table>

### Horizontal Deflection

<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>MEASURE</th>
<th>ESTIMATED INSTALLATION COST 2005 Canadian Dollars</th>
<th>FACTORS AFFECTING COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-1</td>
<td>Chicane – Two Lane</td>
<td>$12 000 - $120 000</td>
<td>Width of roadway, landscaping, labour and material</td>
</tr>
<tr>
<td>H-2</td>
<td>Curb Radius Reduction</td>
<td>$3 600</td>
<td>Radius of original curb, drainage requirements, presence of utilities, labour and material</td>
</tr>
<tr>
<td>H-3</td>
<td>On Street Parking</td>
<td>$60 - $120 per sign</td>
<td>Number of signs required</td>
</tr>
<tr>
<td>H-4</td>
<td>Lane Narrowing</td>
<td>Varies Greatly</td>
<td>Length and width of narrowing area, colour of paint</td>
</tr>
<tr>
<td>H-5</td>
<td>Raised Median Island</td>
<td>$6 000 - $12 000 per island</td>
<td>Width of island, location of utilities, labour and material</td>
</tr>
<tr>
<td>H-6</td>
<td>Chicane – One Lane</td>
<td>$12 000 - $120 000</td>
<td>Width of roadway, landscaping, labour and material</td>
</tr>
<tr>
<td>H-7</td>
<td>Curb Extension</td>
<td>$6 000 - $12 000 per curb extension per side</td>
<td>Length and width of extensions, drainage requirements, labour and material</td>
</tr>
<tr>
<td>H-8</td>
<td>Traffic Circle</td>
<td>$12 000 - $36 000 per circle</td>
<td>Diameter of circle, location of utilities, landscaping, labour and materials</td>
</tr>
</tbody>
</table>

### Diversion

<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>MEASURE</th>
<th>ESTIMATED INSTALLATION COST 2005 Canadian Dollars</th>
<th>FACTORS AFFECTING COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-1</td>
<td>Intersection Channelization</td>
<td>$3 600</td>
<td>Extent of channelization, labour and material</td>
</tr>
<tr>
<td>O-2</td>
<td>Raised Median Through Intersection</td>
<td>$12 000 - $36 000</td>
<td>Length &amp; width of median, landscaping, labour and material</td>
</tr>
<tr>
<td>O-3</td>
<td>Right In/Right Out Island</td>
<td>$6 000 - $12 000</td>
<td>Width of roadway, labour and material</td>
</tr>
</tbody>
</table>

### Vertical Deflections

<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>MEASURE</th>
<th>ESTIMATED INSTALLATION COST 2005 Canadian Dollars</th>
<th>FACTORS AFFECTING COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-1</td>
<td>Raised Crosswalk</td>
<td>$6 000 - $12 000 per raised crosswalk</td>
<td>Width of roadway, drainage requirements, labour and materials</td>
</tr>
<tr>
<td>V-2</td>
<td>Raised Intersection</td>
<td>$47 000 - $89 000</td>
<td>Width of intersecting roadways, labour and material</td>
</tr>
<tr>
<td>V-3</td>
<td>Sidewalk Extension</td>
<td>$6 000 - $12 000</td>
<td>Width of roadway, labour and material</td>
</tr>
<tr>
<td>V-4</td>
<td>Speed Hump (local)</td>
<td>$3 000 - $6 000 per speed hump</td>
<td>Width of roadway, labour and material</td>
</tr>
<tr>
<td>V-5</td>
<td>Speed Hump (collector)</td>
<td>$3 000 - $6 000 per speed hump</td>
<td>Width of roadway, labour and material</td>
</tr>
<tr>
<td>V-6</td>
<td>Textured Crosswalk</td>
<td>$60/m² - $180/m²</td>
<td>Width of roadway, labour and material</td>
</tr>
</tbody>
</table>

### Diversion

<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>MEASURE</th>
<th>ESTIMATED INSTALLATION COST 2005 Canadian Dollars</th>
<th>FACTORS AFFECTING COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-4</td>
<td>Directional Closure</td>
<td>$2 400 - $30 000</td>
<td>Road width, length of closure, drainage requirements, landscaping, labour and materials</td>
</tr>
<tr>
<td>O-5</td>
<td>Diverter</td>
<td>$12 000 - $47 000</td>
<td>Intersection width, drainage requirements, labour and materials</td>
</tr>
<tr>
<td>O-6</td>
<td>Full Closure</td>
<td>$12 000 - $36 000 (excluding property requirements)</td>
<td>Road width, configuration of turnaround area, landscaping, labour and materials</td>
</tr>
</tbody>
</table>

(3) Canadian Guide To Neighbourhood Traffic Calming. NOTE: Price data converted from 1998 Dollars to 2005 Dollars Using Published Consumer Price Index Data
# Appendix F Image References

## Figure 5

<table>
<thead>
<tr>
<th>Reference #</th>
<th>Measure</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>Maximum Speed (1)</td>
<td>Sign placard made to Ministry standards displaying the maximum allowed speed in kilometers per hour.</td>
<td><img src="image1.jpg" alt="Maximum Speed Sign" /></td>
</tr>
<tr>
<td>S-2</td>
<td>Right or Left Turn Prohibited (2)</td>
<td>Sign placard made to ministry standards displaying the turning movement that is restricted. Sign shows red circle with line strike through the illegal turning movement.</td>
<td><img src="image2.jpg" alt="No Left Turn Sign" /></td>
</tr>
<tr>
<td>S-3</td>
<td>Through Traffic Prohibited</td>
<td>Sign placard made to ministry standards displaying &quot;Do Not Enter&quot;. Typically the sign is placed in conjunction with one way streets.</td>
<td><img src="image3.jpg" alt="Do Not Enter Sign" /></td>
</tr>
<tr>
<td>S-4</td>
<td>Traffic Calmed Neighbourhood (6)</td>
<td>An Example of Traffic Calmed Neighbourhood sign. There are no standards for signage, however the intent of the sign is to give notice to drivers that traffic calming measures have been implemented on the streets.</td>
<td><img src="image4.jpg" alt="Traffic Calmed Neighbourhood Sign" /></td>
</tr>
<tr>
<td>Reference #</td>
<td>Measure</td>
<td>Description</td>
<td>Image</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>H-1</td>
<td>Chicane - Two Lane (2)</td>
<td>A change in horizontal alignment of the road designed to slow traffic down and or to enhance pedestrian crossing locations. Both directional lanes shift.</td>
<td></td>
</tr>
<tr>
<td>H-2</td>
<td>Curb Radius Reduction (2)</td>
<td>Reducing the curb radius creates a sharper turn and thus forces vehicles to slow down in order to negotiate the turn.</td>
<td></td>
</tr>
<tr>
<td>H-3</td>
<td>On Street Parking (2)</td>
<td>A passive form of traffic calming. On street parking forces vehicles to slow down because of the reduction in the width of the roadway.</td>
<td></td>
</tr>
<tr>
<td>H-4</td>
<td>Lane Narrowing (2)</td>
<td>Similar to on street parking, lane narrowing can be done as either a painted line treatment or an actual reduction in pavement width.</td>
<td></td>
</tr>
<tr>
<td>H-5</td>
<td>Raised Median Island (2)</td>
<td>An island that can be landscaped or left as hard surfaces designed to narrow lanes, restrict left turns and channel traffic.</td>
<td></td>
</tr>
</tbody>
</table>
### Horizontal Deflection

<table>
<thead>
<tr>
<th>Reference #</th>
<th>Measure</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-6</td>
<td>Chicane - One Lane (4)</td>
<td>In addition to the horizontal alignment change, both directional lanes of traffic must proceed through the area one at a time.</td>
<td><img src="image1.jpg" alt="Image" /></td>
</tr>
<tr>
<td>H-7</td>
<td>Curb Extension (4)</td>
<td>A narrowing of the road as a result of extending the curb out to narrow the laneway, often used in conjunction with a pedestrian crossing.</td>
<td><img src="image2.jpg" alt="Image" /></td>
</tr>
<tr>
<td>H-8</td>
<td>Traffic Circle (2)</td>
<td>Placed at intersections, they are designed to slow traffic and reduce vehicle conflicts.</td>
<td><img src="image3.jpg" alt="Image" /></td>
</tr>
</tbody>
</table>

### Diversion

<table>
<thead>
<tr>
<th>Reference #</th>
<th>Measure</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-1</td>
<td>Intersection Channelization (4)</td>
<td>Designed to force traffic in one direction only, such as a right hand turn only for all directions. Typically used at 4 way stop locations.</td>
<td><img src="image4.jpg" alt="Image" /></td>
</tr>
<tr>
<td>O-2</td>
<td>Raised Median Through Intersection (3)</td>
<td>Designed to prevent through traffic from proceeding. Also used to force traffic into right hand turns only as well as used to provide refuge for crossing pedestrians.</td>
<td><img src="image5.jpg" alt="Image" /></td>
</tr>
<tr>
<td>Reference #</td>
<td>Measure</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>O-3</td>
<td>Right in / Right out Island (4)</td>
<td>Designed to force traffic to turn right only. Typically used at intersections of local and collector roads to prevent traffic queuing behind vehicles making left hand turns.</td>
<td></td>
</tr>
<tr>
<td>V-1</td>
<td>Raised Crosswalk (3)</td>
<td>Usually larger than a speed hump, a raised crosswalk is designed to slow traffic at or before a pedestrian crossing.</td>
<td></td>
</tr>
<tr>
<td>V-2</td>
<td>Raised Intersection (5)</td>
<td>Raised intersections typically include the pedestrian crossings within them and are designed to slow traffic traveling through them.</td>
<td></td>
</tr>
<tr>
<td>V-3</td>
<td>Sidewalk Extension (3)</td>
<td>Pavement treatments can change the visual appearance of a road which can highlight pedestrian crossings at intersections or mid block.</td>
<td></td>
</tr>
<tr>
<td>V-4</td>
<td>Speed Hump (6)</td>
<td>A vertical pavement addition that forces traffic to slow down while passing over in order to maintain driver comfort while passing over it.</td>
<td></td>
</tr>
<tr>
<td>Reference #</td>
<td>Measure</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>O-4</td>
<td>Directional Closure (4)</td>
<td>Prevents traffic from entering from one direction.</td>
<td></td>
</tr>
<tr>
<td>O-5</td>
<td>Diverter (4)</td>
<td>Channels traffic at an intersection preventing through traffic.</td>
<td></td>
</tr>
<tr>
<td>O-6</td>
<td>Full Closure (4)</td>
<td>Complete closure of the street preventing all but pedestrian and bicycle movements.</td>
<td></td>
</tr>
</tbody>
</table>

**Photo Sources:**
1) City of Red Deer
2) City of Alameda
3) City of Langley
4) Corporation of the City of Delta
5) Columbia
6) City of Vaughan
Appendix F: Traffic Calming Policy

I Traffic Calming In Existing Neighbourhoods

I.I Respond To Public Initiatives

- Resident(s) will contact Public Works – Transportation Planning or their respective Council member.
- Administration will perform the warrant study.

I.II Warrant Study

- Warrant study will identify streets, intersections and neighbourhood areas that could be a part of the traffic-calming project based on the location of Collector and Arterial Roads, school catchment areas, natural landforms and railways.
- Study may follow boundaries such as physical landforms (river) and collector / arterial roadways, railway right of ways and Ward boundaries.
- Public Works – Transportation Planning will study the selected road sections and determine what type of traffic calming measures are warranted based on the scoring mechanism.
- See Figures 1, 2 and 3 on pages 2, 3 and 4 for warrant study evaluation forms for Local, Class I Collector and Class II Collector Roads.

I.III After Completion Of Warrant Study

The warrant study will determine what level of traffic calming will be required in order to alleviate the traffic problems identified. These levels are different for Local and Collector Roads. See Figure 4, page 5 for information on what traffic calming devices are allowed for each level and for each road type (Local or Collector Roads).

- If warrant study indicates that improvements are not necessary, then the requestor and Council members will be notified by mail indicating that the warrants are not met and that no identifiable problem exists and therefore traffic calming measures are not required.
- If warrant study finds that area streets require some form of traffic calming a petition will be prepared by Public Works – Transportation Planning and sent to the requestor for circulation to gauge community support. **
Figure 1 – Local Road Evaluation Sheet

**Local Road Evaluation Sheet**

**Street Name:**

**Between Streets:**

<table>
<thead>
<tr>
<th>Excessive Speed</th>
<th>Posted Limit</th>
<th>Average Speed</th>
<th>85th Percentile Speed</th>
<th>Speed Overage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 85th percentile speed = 10km/h over Posted Limit then 10 Points Awarded. One additional point for every km/h additional to a max of 20 points.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Excessive Volume</th>
<th>Expected Max Volume / Day</th>
<th>Actual Volume / Day</th>
<th>Difference</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>If Vehicles Per Day meets threshold for Local Road then 12 points awarded. For every 500 vehicles per day additional 2 points awarded to a maximum of 20 Points.</td>
<td></td>
<td>3000 VPD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bicycle Route</th>
<th>Designation in BUMP</th>
<th>Route On Street?</th>
<th>Route Signed?</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>If road has on street bicycle lanes or is a signed route award 10 points.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collisions</th>
<th>Number of Accidents</th>
<th>Accidents / km</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect number of accidents in past 3 years. Divide by length of street. If result = 0 then 0 Points Awarded. If Result 0 &gt; 1 then 5 Points Awarded. If Result 1 &gt; 3 then 10 Points Awarded. If Result 3 &lt; then 15 Points Awarded.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pedestrian Generators</th>
<th>Generator 1</th>
<th>Generator 2</th>
<th>Generator 3</th>
<th>Generator 4</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks = 5 Points, Elementary School = 5 Points, High School = 4 Points, University = 3 Points, Religious Building = 3 Points, Community Centre / Library = 3 Points, Neighbourhood Commercial = 3 Points. To a maximum of 15 Points.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residential Frontage</th>
<th>Percent of Residential Frontage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% = 10 Points, 90% = 9 Points … 10% = 1 Point, 0% = 0 Points.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Score**
Figure 2 – Class II Collector Road Evaluation Sheet

Class II Collector Road Evaluation Sheet

Street Name: 

Between Streets: 

<table>
<thead>
<tr>
<th></th>
<th>Excessive Speed</th>
<th>Posted Limit</th>
<th>Average Speed</th>
<th>85th Percentile Speed</th>
<th>Speed Overage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 85th percentile speed = 10km/h over Posted Limit then 10 Points Awarded. One additional point for every km/h additional to a max of 20 points.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Excessive Volume</th>
<th>Expected Max Volume / Day</th>
<th>Actual Volume / Day</th>
<th>Difference</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>If Vehicles Per Day meets threshold for Class II Collector Road Road then 12 points awarded. For every 500 vehicles per day additional 2 points awarded to a maximum of 20 Points.</td>
<td>Expected Max Volume / Day</td>
<td>6000 VPD</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Bicycle Route</th>
<th>Designation in BUMP</th>
<th>Route On Street?</th>
<th>Route Signed?</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>If road has on street bicycle lanes or is a signed route award 10 points.</td>
<td>Designation in BUMP</td>
<td>Route on Street?</td>
<td>Route Signed?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Collisions</th>
<th>Number of Accidents</th>
<th>Accidents / km</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect number of accidents in past 3 years. Divide by length of street. If result = 0 then 0 Points Awarded. If Result 0 &gt; 1 then 5 Points Awarded. If Result 1 &gt; 3 then 10 Points Awarded. If Result 3 &lt; then 15 Points Awarded.</td>
<td>Number of Accidents</td>
<td>Accidents / km</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Pedestrian Generators</th>
<th>Generator 1</th>
<th>Generator 2</th>
<th>Generator 3</th>
<th>Generator 4</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks = 5 Points, Elementary School = 5 Points, High School = 4 Points, University = 3 Points, Religious Building = 3 Points, Community Centre / Library = 3 Points, Neighbourhood Commercial = 3 Points. To a maximum of 15 Points.</td>
<td>Generator 1</td>
<td>Generator 2</td>
<td>Generator 3</td>
<td>Generator 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Residential Frontage</th>
<th>Percent of Residential Frontage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% = 10 Points, 90% = 9 Points … 10 % = 1 Point, 0% = 0 Points.</td>
<td>Percent of Residential Frontage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Score: 


Figure 3 – Class I Collector Road Evaluation Sheet

Class I Collector Road Evaluation Sheet

<table>
<thead>
<tr>
<th>Street Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Streets:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Excessive Speed</th>
<th>Posted Limit</th>
<th>Average Speed</th>
<th>85th Percentile Speed</th>
<th>Speed Overage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 85th percentile speed = 10km/h over Posted Limit then 10 Points Awarded. One additional point for every km/h additional to a max of 20 points.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Excessive Volume</th>
<th>Expected Max Volume / Day</th>
<th>Actual Volume / Day</th>
<th>Difference</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>If Vehicles Per Day meets threshold for Class I Collector Road Road then 12 points awarded. For every 500 vehicles per day additional 2 points awarded to a maximum of 20 Points.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bicycle Route</th>
<th>Designation in BUMP</th>
<th>Route On Street?</th>
<th>Route Signed?</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>If road has on street bicycle lanes or is a signed route award 10 points.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collisions</th>
<th>Number of Accidents</th>
<th>Accidents / km</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect number of accidents in past 3 years. Divide by length of street. If result = 0 then 0 Points Awarded. If Result 0 &gt; 1 then 5 Points Awarded. If Result 1 &gt; 3 then 10 Points Awarded. If Result 3 &lt; then 15 Points Awarded.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pedestrian Generators</th>
<th>Generator 1</th>
<th>Generator 2</th>
<th>Generator 3</th>
<th>Generator 4</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks = 5 Points, Elementary School = 5 Points, High School = 4 Points, University = 3 Points, Religious Building = 3 Points, Community Centre / Library = 3 Points, Neighbourhood Commercial = 3 Points. To a maximum of 15 Points.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residential Frontage</th>
<th>Percent of Residential Frontage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% = 10 Points, 90% = 9 Points … 10 % = 1 Point, 0% = 0 Points.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Score</th>
</tr>
</thead>
</table>
(3, Canadian Guide to Neighbourhood Traffic Calming) Chart information regarding the effect of each traffic calming device on various issues ie: Speed Reduction based on research conducted by ITE and included in the ITE Canadian Guide to Neighbourhood Traffic Calming.

NOTE: All devices listed above are approved for use in the Province of Ontario and are designed and signed according to the Ontario Traffic Manual.
Figure 5 – Appropriate Traffic Calming Devices For Collector Roads

<table>
<thead>
<tr>
<th>Level 1 Calming – Score 31&lt;46</th>
<th>Signing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure</td>
<td>Speed Reduction</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>Minor</td>
</tr>
<tr>
<td>Right of Left Turn Prohibited</td>
<td>Nil</td>
</tr>
<tr>
<td>Through Traffic Prohibited</td>
<td>Nil</td>
</tr>
<tr>
<td>Passive Signage (ie: Traffic Calmed Neighbourhood)</td>
<td>Nil</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2 Calming – Score 46 &lt; 76</th>
<th>Horizontal Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure</td>
<td>Speed Reduction</td>
</tr>
<tr>
<td>Chicane - Two Lane</td>
<td>Minor</td>
</tr>
<tr>
<td>Curb Radius Reduction</td>
<td>Minor</td>
</tr>
<tr>
<td>On Street Parking</td>
<td>Minor</td>
</tr>
<tr>
<td>Lane Narrowing</td>
<td>Minor</td>
</tr>
<tr>
<td>Raised Median Island</td>
<td>Minor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3 Calming – Score 76 &lt; Max</th>
<th>Horizontal Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure</td>
<td>Speed Reduction</td>
</tr>
<tr>
<td>Curb Extension</td>
<td>Minor</td>
</tr>
<tr>
<td>Intersection Channelization</td>
<td>Nil</td>
</tr>
<tr>
<td>Raised Median Through Intersection</td>
<td>Substantial</td>
</tr>
<tr>
<td>Right in / Right out Island</td>
<td>Substantial</td>
</tr>
</tbody>
</table>

*(3, Canadian Guide to Neighbourhood Traffic Calming)*  
* Collector roads themselves cannot be obstructed, but the local roads that intersect them can have obstructing traffic calming measures.*

**NOTE:** All devices listed above are approved for use in the Province of Ontario and are designed and signed according to the Ontario Traffic Manual.

**I.IV Petition Circulation**

- If warrant study identifies a need for traffic calming devices, the public / complainant will be responsible for completing a petition of the affected street(s) residences.
- Public Works – Transportation Planning will provide the individual with the necessary information as to whom and where the petition must cover.
- The public must approve the initiation of this study by showing signature support of 66% or more of the residences.
- If less than 66% of the affected residents approve of the study initiation, then the study will stop.
- If 66% or more of the affected residents do support the study, then the process will continue.
I.V Public Approval

- If the public approves of the study then:
  - Emergency services, Public Works and Transit Windsor will be notified of the traffic calming study.
  - The information will note the possible traffic calming devices that have been identified in the warrant study and the roads that may have certain devices applied.
  - Public Works – Transportation Planning will request that the departments provide comments on specific services that could be affected on the identified streets / neighbourhood.
  - Public Works – Transportation Planning will request a meeting with all affected City Departments.
  - Public Works – Transportation Planning will request service maps of all affected departments for later public meeting use. (ie: emergency routes, refuse collection route plan / recycle collection route plan, winter control plan, Transit Windsor bus routes Specific to the area being studied.)

I.VI Environmental Assessment Process

- Administration will evaluate potential costs of a traffic calming plan to determine the number of public meetings based on the EA process **.
- Public notification of the upcoming meeting will take place according to Municipal Class EA process:
  - Notices in the local newspaper will be placed (Notice of study commencement and notice of public information session)

Public Meeting One

- The preliminary public meeting is recommended for affected property owner input.
- Traffic calming options dictated by the warrant study will be presented to the public.
- Other affected City Departments (ie: Transit Windsor, Public Works – Refuse Collection, Public Works – Winter Control, Emergency Services, and Planning, WAAC, Cycling Committee) will also be invited to answer questions and to ensure a good administrative presence.
- Other affected agencies (ie: WAAC, Cycling Committee etc.) will also be invited to provide comments and feedback.
- Each affected street will be clearly identified displaying potential traffic calming options based on warrant study score.
- No actual devices will be portrayed on the streets, but rather, the individual devices will be displayed on separate boards showing the various levels of traffic calming devices with pictures and costs.
- Surveys and information will be collected and we will encourage further public input for the length of the project.
- Further data may be collected based on recommendations or input from the public and will aid in the selection of a final plan for review.
Preparation Of Alternatives

- Based on information collected at the preliminary meeting and further data collected after the first public meeting, Administration will prepare and study alternatives that both follow the Traffic Calming Policy and incorporate public suggestions.
- Alternative options will be circulated amongst affected City Departments for comments and suggestions.

Selection Of Recommended Design

- Administration will select the most appropriate designs for the traffic calming project and will circulate the final design with affected city departments.
- Changes and suggestions based on the final design will be made.

Public Meeting Two

- The recommended design will be displayed.
- Other affected City Departments will also be invited to answer questions and to ensure a good Administrative presence.
- The estimated cost of the recommended option will also be displayed to give Council a better understanding of the funding requirements.

I.VII Recommend Design and Council Approval For Funding

- Members of the public will be notified of the upcoming Council meeting and the issue that will be addressed via:
  - Notices in the local newspaper will be placed
  - Notices on the City of Windsor Web Site will also be posted.
  - Letters to interested residents will also be sent notifying them of the upcoming meeting. The list will be compiled from the sign-in sheet at the previous public meeting.
- Council will be asked to include the funding in the capital works budget.
- At this point no changes can be made to the recommended design.
- Approving only part or a few devices will defeat the purpose of the entire traffic calming project and will result in its failure and therefore must be approved as a whole project.

* NOTE: If it is found that only Level 1 Traffic Calming devices are required for any given section of roadway, then Administration will implement the signage improvements where necessary.

** NOTE: Traffic Calming projects typically fall under Schedule ‘B’ of the Municipal Class EA Planning and Design Process (Projects under $1.5 million). The process is included in the appendix.
II Traffic Calming In New Neighbourhoods

Traffic Calming should be put in place in all new neighbourhoods. This traffic calming must be placed in accordance to the actual road classification in the Official Plan for the area. The designation of those streets will dictate the type of traffic calming devices that can be implemented.

Transportation Planning will be looking for all developers to act proactively regarding the placement of approved traffic calming devices throughout the plan of subdivision. Specifically, we will be looking for the following measures:

• Intersections between two Local Roads require roundabouts or traffic circles.
• Intersections between Local Roads and Collector Roads require curb extensions and special sidewalk treatments.
• Chicanes are required throughout any subdivision plan where there are long straight sections of roadway (300 metres or more).
• One lane chicanes can be located on Local Roads and two lane chicanes are acceptable both on Collector and Local Roads.
• Lane narrowings combined with pedestrian crossings at crucial locations where pedestrians may cross to utilize parks, or other pedestrian generators are required on both Local and Collector Roads.
• Median islands should be used extensively throughout all neighbourhood designs especially on Collector Roads and at key locations on Local Roads.
• Median islands should also be used at key locations to prevent nearby traffic from utilizing local roads as short cuts. This can be achieved by placing medians at intersections with local roads where short-cutting may be a future problem.

In all cases the design and proposed location of these traffic calming measures are required to be included in the application for a plan of subdivision. Each device location must include the following elements:

• All Traffic Calming Devices must meet the design criteria included in the Canadian Guide to Neighbourhood Traffic Calming – Transportation Association of Canada.
• All Traffic Calming Devices must include all required signage and markings according to the Canadian Guide to Neighbourhood Transportation Association of Canada.

These drawings will be circulated to all departments for comments.
Text References
1) City of Oshawa Traffic Calming Policy
2) City of Coquitlam
3) ITE Canadian Guide To Neighbourhood Traffic Calming