

APPENDIX C

Traffic Calming Policy 2007



**Transportation Department
City of Kingston**

Introduction and Background

The City of Kingston receives numerous concerns from citizens every year regarding traffic on residential roadways. The majority of concerns are related to speeding, aggressive motorist behaviour and neighbourhood shortcutting. Residents are becoming increasingly frustrated with this type of behaviour and are insistent that the City take action to improve the quality of life and level of safety on their streets.

The definition of traffic calming as defined by the Institute of Transportation Engineers (ITE) is as follows:

“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 Hudson Drive Traffic Calming Pilot Project thus far represents the City’s first official traffic calmed street. At the conclusion of an Environmental Assessment (EA) process in 2004, it was recommended that a series of four speed humps and a pair of curb extensions be installed on Hudson Drive. It is important to note that due to recent changes within the Environmental Assessment Act, EA’s are no longer required for traffic calming projects.

In July 2005, four speed humps were installed on Hudson Drive between Bayridge Drive and Development Drive. A pair of curb extensions were installed on Hudson Drive adjacent to the parks in August of 2006. Since the installation of the traffic calming measures, no collisions have been reported on this portion of Hudson Drive. Before the traffic calming measures were installed, there was an average of two collisions per year reported in this area. There has been a slight reduction in vehicle volumes on Hudson Drive but this could be related to typical daily fluctuations in traffic flow.

Numerous vehicle speed surveys have been conducted on Hudson Drive before and after the traffic calming measures were installed. The before surveys indicated that the typical 85th percentile speed (i.e. speed adhered to by 85% of all drivers) in this area was 56 km/h. After the speed humps were installed, the 85th percentile speed dropped to an average of 50 km/h. Speed surveys completed after the curb extensions were installed in addition to the existing speed humps, revealed that the 85th percentile speed was 51 km/h.

Emergency response providers including Kingston City Police, Frontenac Ambulance Services and the Kingston Fire Department were consulted several times throughout the traffic calming monitoring process. No comments were received that stated that there were any issues with respect to response times or patient discomfort after the traffic calming measures were installed.

In 2005, the cost to install each hump on Hudson Drive was \$2600. This cost included installation, paint and signage. The total cost for four speed humps was thus \$10,400. The cost to install the pair of curb extensions on Hudson Drive in 2006 was \$8600. Therefore the total construction cost of the Hudson Drive Traffic Calming Project was **\$19,000**.

As a result of the success of the Hudson Drive Traffic Calming Pilot Project and ongoing concerns regarding speeding on residential streets, a policy for the implementation of future traffic calming measures is required. On April 12th, 2007 the Environment, Infrastructure and Transportation Policy Committee accepted the results of the *Hudson Drive Traffic Calming Pilot Project Technical Evaluation* and directed the Transportation Department to develop a Traffic Calming Policy for the City.

The objectives of this Traffic Calming Policy are to:

- Provide a system that prioritizes City streets for potential traffic calming measures
- Ensure that there is adequate support for traffic calming from affected residents
- Enhance safety and convenience for all users of the street
- Improve the neighbourhood environment
- Minimize conflicts between street users
- Reduce the number and severity of collisions
- Reduce the speed of motorized traffic
- Reduce the volume of traffic that has neither its origin or destination within a residential neighbourhood

Traffic Calming Measures

Physical traffic calming measures include both vertical and horizontal measures. Descriptions of these measures are provided below.

Vertical Deflection

Vertical traffic calming measures include the following:

Raised crosswalks – a marked pedestrian crosswalk at an intersection or mid-block location that is constructed at a higher elevation than the adjacent roadway.

Raised intersections – an intersection, including crosswalks, that is constructed at a higher elevation than the adjacent roadway.

Rumble strips – raised buttons, bars or grooves closely spaced at regular intervals on the roadway that create both noise and vibration in moving vehicles.

Sidewalk extensions – A sidewalk is continued across a local street or intersection. For a “raised” sidewalk extension, it is continued at its original elevation, with the local roadway raised to the level of the sidewalk at the intersection. For an “unraised” sidewalk extension, the sidewalk is lowered to the level of the roadway.

Textured crosswalks – A crosswalk incorporating a textured and/or patterned surface which contrasts with the adjacent roadway.

Speed humps – A raised area of a roadway, which deflects both the wheels and frame of a traversing vehicle. Vehicles traversing a properly designed speed **hump** at a reasonable speed i.e. 30 km/hr, can drive with relative ease across the **hump**. **Speed bumps** on the other hand, are sometimes installed on private roadways and in commercial parking lots and can be very abrupt and jarring to motorists. Only properly designed **speed humps** as shown in Figure 1 are recognized within the *Canadian Guide to Neighbourhood Traffic Calming*.

Horizontal Deflection

Horizontal traffic calming measures include the following:

Chicanes – A series of curb extensions on alternating sides of a roadway, which narrow the roadway and require drivers to steer from one side of a roadway to the other to travel through the chicane. Typically, a series of at least three curb extensions is used.

Curb extensions – A horizontal intrusion of the curb into the roadway resulting in a narrower section of roadway.

Curb radius reduction – The reconstruction of an intersection corner using a smaller radius, usually in the 3.0 m to 5.0 m range.

On-street parking – The reduction of the roadway width available for vehicle movement by allowing motor vehicles to park adjacent and parallel to the curb.

Raised median island – An elevated median constructed on the centerline of a two-way roadway through an intersection, which prevents left turns and through movements to and from the intersection roadway.

Traffic circle – A raised island located in the centre of an intersection, which requires vehicles to travel through the intersection in a counter-clockwise direction around the island.

- **Potential traffic calming measures will not always consist of only speed humps. Other traffic calming options or a combination of vertical and horizontal measures must be considered.**
- **If traffic calming measures are installed in a heritage area, the local streetscape will be considered in choosing the appropriate measures.**
- **Traffic calming should only be considered on local and collector streets.**

Although traffic calming measures can be very effective at reducing vehicle speeds, some potential disbenefits that need to be considered are as follows:

- Traffic may be diverted to parallel streets
- Emergency service vehicles could be delayed
- Increased noise from vehicle deceleration and acceleration
- Increased Maintenance

Despite the above-noted disbenefits that must be considered, none of the above concerns were an issue with the Hudson Drive Traffic Calming Project. Other traffic-calmed municipalities in Canada have been able to deal with these potential disbenefits in a satisfactory manner.

- **The Transportation Department will monitor the impact of all newly installed traffic calming measures and complete before and after studies that consider vehicle volumes, vehicle speeds, collision history and impacts on emergency service vehicles, transit and roadway maintenance.**

All-Way Stop Control

The Transportation Department receives a significant number of requests for all-way stop signs to be installed at intersections throughout the City as a traffic calming measure. The *Canadian Guide to Neighbourhood Traffic Calming* states the following with respect to the use of stop signs for traffic calming purposes:

“Stop signs used as a traffic calming measure may not be effective and may create compliance problems.”

The guide makes further comments regarding stop signs such as:

“Unwarranted installations require regular police enforcement”

“When stop signs are overused and/or unwarranted, compliance may decrease”

“When stop signs are unwarranted, vehicle speeds at mid-block locations may increase”

A recent study completed by W.Martin Bretherton, a traffic engineer in Georgia, USA, reviewed over 70 technical papers regarding all-way stops and their success and failure as traffic control devices in residential areas. Mr.Bretherton states the following in this study:

“The research found that, overwhelmingly, multi-way stop signs do NOT control speed except under very limited conditions. The research shows that the concerns about unwarranted stop signs are well founded”

One of the most serious issues discussed by Mr.Bretherton with respect to unwarranted stop signs is related to pedestrian safety.

“Safety of pedestrians is decreased at unwarranted multi-way stops, especially small children. It seems that pedestrians expect vehicles to stop at the stop signs but many vehicles have gotten in the habit of running the “unnecessary” stop sign”.

Some research even suggests that the average speed of vehicles between intersections actually increases when unwarranted stop signs are installed as motorists try to make up for lost time.

The Transportation Department uses warrants, updated in 2003, to determine where all-way stop control is required. These warrants consider vehicle and pedestrian volumes, vehicle split (percent of vehicles on the major street versus the minor street) as well as collision history.

- **All-way stop control will not be considered as a traffic calming measure within the context of this policy.**

Community Safety Zones & Reduced Speed Limits

In recent years, Transportation Department staff have assessed the effectiveness of Community Safety Zones and reduced speed limit areas in the City.

Extensive speed studies and research completed on Community Safety Zones and reduced speed limit areas in the City of Kingston, clearly demonstrate that signage alone is not an effective traffic calming measure. Without constant and aggressive enforcement by police, motorists continue to drive at the speed that they are comfortable with, despite the “Community Safety Zone Signage” or the “40 km/hr” regulatory signage. For example, on Queen Mary Road where the posted speed was reduced from 50 km/hr to 40 km/hr, numerous speed studies concluded that the majority of motorists continued to drive the same speed that they did when the speed limit was posted at 50 km/hr. Some residents of this street even believe that the lowered speed limit contributes to a false sense of safety and increases driver frustration and aggression towards motorists that do drive 40 km/hr.

The results of this local research are very much in keeping with what has been the experience in other cities.

“Reduced maximum legal vehicle speeds used as traffic calming measures many not be effective and may create compliance problems. Raised crosswalks or speed humps would be more effective in reducing vehicle speeds”

(Source: Canadian Guide to Neighbourhood Traffic Calming)

There has been limited success with the installation of reduced speed limits in school zones. In the City of Kingston, on Taylor Kidd Boulevard west of Bayridge Drive where the 40 km /h zone was enhanced with amber flashers, slight decreases in vehicle speed were noted, especially during periods of heavy enforcement.

A recent study completed by the City of Saskatoon concluded that posted speed reductions can be marginally effective in school zones as long as there is proper education and aggressive enforcement.

- **Community Safety Zones or reduced speed limit zones will not be considered as traffic-calming measures within the context of this policy. The Transportation Department will consider reduced speed limits (40 km/h) in school zones on a case-by-case basis.**

Community Involvement

Community involvement is critical to the success of any traffic calming project. The *Canadian Guide to Neighbourhood Traffic Calming* states that:

“Traffic calming plans should be developed in consultation with the community. In some cases, “solutions” to traffic problems have been developed without sufficient input from the community, and as a result have generated opposition which ultimately prevented the solutions from being implemented, or resulted in the solutions being removed. In many cases, opposition arose not because the solutions were ineffective but because they were not what the community wanted.”

Public meetings, public open houses and neighbourhood surveys are an important component of any neighbourhood traffic calming study.

“The public meeting has the advantage of allowing interaction among participants; this clarifies the existence and extent of traffic problems that need to be addressed and the willingness to accept traffic calming measures; the open house has the advantage of allowing individual residents and business people to comment on the impacts that proposed traffic calming measures would have on their property.”

(Source: City of Fredericton)

As traffic calming measures may have a significant impact on a street, it is prudent to survey the affected residents and obtain a high level of acceptance.

- **Consideration for traffic calming should be initiated by citizens or the local Councillor following consultation with the affected residents and forwarded to the Transportation Department.**

- **In order to provide information to the affected community regarding traffic calming and to gauge the level of support, the Transportation Department will in cooperation with the local Councillor, participate in a minimum of one public community meeting.**
- **All residents fronting or flanking the affected roadway to be traffic calmed must be provided with survey forms or ballots. A minimum 51% return rate is required with at least 60% responding in favour of the proposed traffic calming project.**

Warrants and Criteria for Traffic Calming Measures

The City's Transportation Department receives numerous requests for traffic calming. These requests must be assessed objectively in order to ensure that traffic calming is implemented appropriately. As funds are often limited for the installation of traffic calming measures, there must be a method to compare and rank traffic calming needs amongst "competing" neighbourhoods. The City of Toronto's ranking system has been modified in order to develop a ranking system that could be used by the City of Kingston. Traffic counts, speed studies, adjacent lane use and a review of the collision history are all vital components of this ranking system. This ranking system allows for comparisons to be made between different streets and is outlined in Table 1.0.

Although no minimum total score is required, any street to be ranked and considered for traffic calming measures must at least meet the following requirements:

- 1) The 85th percentile speed must be a minimum of 10 km/h over the posted speed limit and;
 - 2) On local roads, the traffic volume must be between 1,000 and 8,000 vehicles per day while on collector roads, the volume must be between 2,500 and 8,000 vehicles per day.
 - 3) If the 85th percentile speed is more than 15 km/h over the posted speed limit, there is no minimum volume requirement.
- **As requests for traffic calming typically outweigh available funds, traffic calming projects will be ranked according to the system illustrated in Table 1. The highest ranked projects will receive priority for funding. Any street to be ranked and considered for traffic calming measures must at least meet minimum speed and volume requirements.**

Table 1.0 - Traffic Calming Ranking System

RANKING	SPEED	Local Road	Collector Road
Maximum 125 Points	0 to 25 points	<p>1 point for each km/h that the 85th percentile speed is greater than posted speed limit up to 10 km/hr and 2 points per km for each km/h when the speed is more than 10km/h greater than posted speed limit.</p> <p>Minimum and Maximum Traffic Volume Warrants: For streets where traffic calming is proposed, the traffic volume must be between 1,000 and 8,000 vehicles per day.</p> <p>OR</p> <p>On streets where the 85th percentile speed exceeds the warranted speed limit by a minimum of 15 km/h, there is no minimum volume required.</p>	<p>1 point for each km/h that the 85th percentile speed is greater than posted speed limit up to 10 km/hr and 2 points per km for each km/h when the speed is more than 10km/h greater than posted speed limit.</p> <p>Minimum and Maximum Traffic Volume Warrants: For streets where traffic calming is proposed, the traffic volume must be between 1,000 and 8,000 vehicles per day.</p> <p>OR</p> <p>On streets where the 85th percentile speed exceeds the warranted speed limit by a minimum of 15 km/h, there is no minimum volume required.</p>
	VOLUME	Local Road	Collector Road
	0 to 25 points	1 point for every 100 vehicles of daily traffic (0 to 2,500 vehicles per day)	1 point for every 220 vehicles of daily traffic over 2,500 (2,500 to 8,000 vehicles per day)
	COLLISIONS	Local Road	Collector Road
	0 to 25 points	1 point for each collision per km plus 5 points for each injury collision per km	
	PEDS & CYCLISTS	Local Road	Collector Road
	0 to 25 points	5 points for each pedestrian generator (i.e. park, seniors centre, recreation centre, church or other public institution etc.) 5 points for adjacent school, 2 points for nearby school, 5 points for every 25 cyclists during an 8 hour count	
	ROAD ALIGNMENT	Local Road	Collector Road
	0 to 25 points	5 points for each road alignment restriction (i.e. steep grades, sharp curves etc.), 2 points for a bend in the road	

Summary of Traffic Calming Policy Directives

- 1) Consideration for traffic calming should be initiated by citizens or the local Councillor following consultation with the affected residents and forwarded to the Transportation Department.
- 2) In order to provide information to the affected community regarding traffic calming and to gauge the level of support, the Transportation Department will in cooperation with the local Councillor, participate in a minimum of one public community meeting.
- 3) All residents fronting or flanking the affected roadway to be traffic calmed must be provided with survey forms or ballots. A minimum 51% return rate is required with at least 60% responding in favour of the proposed traffic calming project.
- 4) Potential traffic calming measures will not always only consist of speed humps. Other traffic calming options or a combination of vertical and horizontal measures must be considered.
- 5) Traffic calming should only be considered on local and collector streets.
- 6) All-way stop control will not be considered as a traffic calming measure within the context of this policy.
- 7) Community Safety Zones or reduced speed limit zones will not be considered as traffic-calming measures within the context of this policy. The Transportation Department will consider reduced speed limits (40 km/h) in school zones on a case-by-case basis.
- 8) Traffic calming projects will be prioritized according to the City's ranking system that considers traffic counts, speed studies, adjacent lane use and a review of the collision history. The highest ranked projects will receive priority for funding. Any street to be ranked and considered for traffic calming measures must at least meet minimum speed and volume requirements.
- 9) The Transportation Department will monitor the impact of all newly installed traffic calming measures and complete before and after studies that consider vehicle volumes, vehicle speeds, collision history and impacts on emergency service vehicles, transit and roadway maintenance.
- 10) Traffic Calming should be considered on streets that are being reconstructed or rehabilitated.

REFERENCES

The Canadian Guide to Neighbourhood Traffic Calming, Transportation Association of Canada, ISBN 1-55187-103-3, 1998

Traffic Calming Policy, Transportation Services, City of Toronto, 2003