

Guidelines for Establishing Posted Speed Limits

2011



Traffic Division
Engineering Department
City of Kingston

Introduction and Background

The "*Guidelines for Establishing Posted Speed Limits*" were created to provide a framework to standardize posted speed limits within the City of Kingston. These Guidelines outline methodologies to be utilized in the City to establish appropriate posted limits in urban and rural areas as well as in school zones. The intent of the Guidelines is to **reduce** posted speed limits where necessary, not to increase posted speed limits.

To establish speed limits in both the urban and rural areas of the City, the methodology from the "*Canadian Guidelines for Establishing Posted Speed Limits*" published by the Transportation Association of Canada (TAC), has been incorporated into the City's Guidelines. It will be used along with good engineering judgment to determine appropriate posted speed limits.

Within the urban areas of the City south of Highway 401, the Guidelines will be used to assess roadways with an existing posted speed limit of 60 km/h or greater. Urban roads with speed limits of 50 km/h or less will not be considered for speed limit reductions in the context of these Guidelines unless within a school zone.

In the rural areas of the City north of Highway 401, there are numerous roadways with significant residential developments, numerous sharp curves or narrow pavement widths, where reduced speed limits will be considered. A key component of these Guidelines will be to assess all roadways in the rural areas in order to determine appropriate posted speed limits.

Traffic within school zones is an ongoing and serious concern throughout the City. These Guidelines will facilitate the development of reduced speed limit zones adjacent to primary schools where young children are present.

Police presence will be essential to enforce the reduced posted speed limits, especially within school zones.

Posted Speed Limits in Urban and Rural Areas

In accordance with the *Highway Traffic Act (HTA) of Ontario*, unless signage is posted, the defacto speed limit is 50 km/h in urban areas and 80 km/h in rural areas. Within Kingston, unless posted signs state otherwise, the maximum speed limit is 50 km/h on roadways south of the 401 and 80 km/h on roadways north of the 401. Without the HTA defacto speed limit provision, municipalities would be required to provide an excessive amount of signage which would be unsightly and cost prohibitive to install and maintain.

The TAC Guidelines include an automated data sheet that considers roadway geometry, pavement width, roadside hazards, pedestrian and cyclist exposure, number of intersections and on-street parking. A detailed description of the information required for the spreadsheet is included in Appendix A. When the required data is entered into the spreadsheet, a recommended posted speed limit is provided for the particular road being assessed. An example of a completed spreadsheet for Latimer Road and Highway 15 is shown in Appendix B.

Although numerous requests are received to establish 40 km/h zones on residential streets, local studies have shown this to be ineffective at reducing speeds. The City has instead been utilizing traffic calming measures such as speed humps, curb extensions, raised crosswalks, mini-roundabouts and driver feedback signs in order to reduce speeds. Since signs must be posted in the rural area if the speed limit is anything other than 80 km/h, there may however be circumstances where a speed limit of 40 km/h could be deemed appropriate.

As part of these Guidelines, the length of individual speed zones will also be reviewed such that where the posted speed limit is 70 km/h or higher, the minimum length for any speed zone will be 1000 metres. Where the posted speed is less than 70 km/h, the minimum length for any speed zone will be 500 metres.

Changes to the posted speed limit will not be considered on any roadway in the City with an existing posted speed limit of 40 km/h.

School Zones

While posted speed limits adjacent to secondary schools (grades 9 to 12) will be considered, the focus of these Guidelines is to implement reduced speed zones adjacent to primary schools (Junior Kindergarten to grade 8) where young children are present. As part of these Guidelines, primary school zones with an existing posted speed limit of 50 km/h will be posted with a maximum speed limit of 40 km/h. The length of the reduced speed limit zone will include the school frontage plus 150 metres on either side of the frontage. If a school has frontage on more than one public street, student access and traffic patterns will be studied in order to determine where the speed limit should be reduced.

In order to reduce motorist confusion and simplify enforcement, the 40 km/h speed limit will be in effect at all times as opposed to during school hours only. Police enforcement will be essential to enforce the reduced posted speed limits, especially during school hours.

Reduced posted speed limits in school zones will be considered on a case-by-case basis under the following circumstances:

- Ø Low volume streets (less than 1000 vehicles per day) where the operating speed is already 45 km/h or less;
- Ø Adjacent to secondary schools;
- Ø On arterial roadways with a posted speed limit of 50 km/h; or
- Ø On any roadway with a posted speed limit of 60 km/h or greater.

Within school zones adjacent to high volume roadways with existing posted speed limits of 60 km/h or greater, motorist compliance could be an issue if speed limits are reduced outside of school hours. Under these circumstances, consideration will be given to reduce the posted speed limit during school hours only. In order to increase driver awareness, the reduced speed limit signage may be accompanied with flashing amber beacons and signage that indicates that the reduced speed limit is only applicable when the amber beacon is flashing. When not flashing, the regular posted speed limit would remain in effect. Flashing amber beacons for reduced speed limits in school zones do however, need to be carefully considered since they can be costly and are not always effective at reducing speeds. Within the context of these Guidelines, all attempts will be made to maintain appropriate vehicle speeds by using posted speed limit signage and enforcement before consideration be given to flashing amber beacons.

The City will not consider speed limit reductions in school zones which result in a reduction of more than 20 km/h from the posted speed limit.

Implementation

Since revisions to posted speed limits require Council approval of by-law amendments, the installation of signage and increased enforcement, the proposed changes will be implemented in phases.

In 2011, the Traffic Division intends to complete a speed limit assessment for twenty roadways in the rural area and five roadways in the urban area of the City. The installation of new speed limit signage is expected to begin in the spring of 2012.

Annual assessments for appropriate speed limits will be on-going for both the urban and rural areas of the City until all necessary roadways have been assessed.

There are currently 45 primary schools in Kingston that are operated by the Limestone District School Board and the Algonquin & Lakeshore Catholic District School Board. In order to prioritize primary schools for reduced speed limit zones, information related to student enrolment, traffic volumes and vehicle speeds have been documented. It is expected that 40 km/h zones could be implemented at a minimum of ten school zones in the City by 2012. The assessment and implementation of reduced speed limit zones at schools will be on-going until all relevant school areas have been considered.

When posted speed limits are changed on any roadway in the City, the Kingston Police Force will be informed such that additional enforcement can be considered.

APPENDIX A

Evaluation Criteria "Canadian Guidelines for Establishing Posted Speed Limits" Transportation Association of Canada (TAC), 2009

1. *Horizontal Alignment*

- Ø Driving risks are increased by horizontal curves hence the measure of horizontal alignment is the number of curves per kilometre.
- Ø A curve is considered to be any part of the roadway which requires steering.

For urban areas:

Risk level	Description
Higher	More than 4 curves per kilometre
Medium	2 to 4 curves per kilometre
Lower	Less than 2 curves per kilometre

For rural areas:

Risk level	Description
Higher	More than 6 curves per kilometre
Medium	3 to 6 curves per kilometre
Lower	Less than 3 curves per kilometre

2. *Vertical Alignment*

- Ø A road with steep grades can decrease sight distance and create a higher risk for motorists than a flat road.
- Ø Uphill grades increase passing maneuvers and motorist frustration, while downhill grades increase speeds and braking distances.

For urban and rural land areas:

Risk Level	Description
Higher	Frequent steep grades (6% or more on 50% of the section or more)
Medium	Some steep grades (4% or more on 50% of

	the section or more)
Lower	Generally moderate grades or flat

3. Average Lane Width

- Ø Motorists typically drive at higher speeds on wider roadways due to fewer constraints.
- Ø Narrower lanes allow for less maneuverability which causes motorists to travel at slower speeds in order to avoid adjacent or oncoming traffic and the curb or shoulder of the road.

For urban and rural areas:

Risk Level	Description
Higher	Narrow – Available lane width is narrow compared to typical roadways with the same road classification
Medium	Moderate – Available lane width is similar to typical roadways with the same road classification
Lower	Wide – available lane width is wide compared to typical roadways with the same road classification

4. Roadside Hazards

- Ø Hazards are defined as non-breakaway fixed objects or non-recoverable risks such as side slopes, rock faces and water hazards.
- Ø Roadways with multiple hazards located close to the driving lane could justify consideration for a reduced speed limit.

For urban areas:

Risk Level	Description
Higher	10 or more hazards per kilometre or continuous hazards on more than 50% of the segment length; on one or both sides
Medium	5 to 9 hazards per kilometre or continuous hazards on 25 to 50% of the segment length, on one or both sides
Lower	Less than 5 hazards per kilometre

For rural areas:

Risk Level	Description
Higher	5 or more hazards per kilometre or continuous hazards on more than 50% of the segment length; on one or both sides
Medium	5 to 9 hazards per kilometre or continuous hazards on 25 to 50% of the segment length,

	on one or both sides
Lower	Less than 2 hazards per kilometre

5. Pedestrian Exposure

- Ø The presence of pedestrians in combination with the facility provided are used to measure the risk on a roadway.
- Ø A roadway with high pedestrian volumes but no sidewalks or shoulders could justify consideration for a reduced speed limit.

For urban and rural areas:

Risk Level	Description
Higher	Roadway is used by pedestrians and no pedestrian facilities are provided
Medium	Roadway is used by pedestrians and a shoulder or trail adjacent to the roadway and at the same elevation as the roadway is provided
Lower	Roadway is used by pedestrians and physically separated pedestrian facilities (sidewalks; trails away from the road) are available; or, roadway has negligible pedestrian demand
N/A (no risk)	Pedestrians are legally prohibited on the roadway

6. Cyclist Exposure

- Ø The presence of cyclists in combination with the facility provided are used to measure the risk on a roadway.
- Ø A roadway with high cyclist volumes but no designated cycling lanes or wide curb lanes might justify consideration for a reduced speed limit.

For urban and rural areas:

Risk Level	Description
Higher	Roadway is used by cyclists and no road space is allocated to bikes
Medium	Roadway is used by cyclists and wide curb lane or paved shoulder is provided
Lower	Roadway is used by cyclists and a designated bike lane is provided; or, roadway is used by cyclists and no road space is allocated to bikes but roadway has very low traffic volumes; or the roadway has negligible

	cyclist demand
N/A (no risk)	Cyclists are legally prohibited on the roadway

7. *Pavement Surface*

- Ø Rough pavement surface conditions can affect motorist maneuverability which results in greater risks at high speeds.

For urban and rural areas:

Risk Level	Description
Higher	Poor or unpaved / gravel
Medium	Fair or rough pavement (significant sections with pot holes, rutting, large cracks, etc)
Lower	Good or smooth

8. *Number of Intersections with Public Roads & Private Driveways*

- Ø A high number of intersections with public roads and private driveways results in increased potential conflicts.
- Ø Consideration for a reduced speed limit could be justified where motorists might encounter a high number of conflicts with cross traffic and left-turning vehicles.
- Ø The required input for the spreadsheet includes the actual number of intersecting public roads or private driveways per segment length.

9. *On-Street Parking*

- Ø On-street parking may create conflicts between moving traffic and parked vehicles.
- Ø The risk associated with on-street parking can be influenced by time restrictions.
- Ø Consideration for a reduced speed limit could be justified when parking is allowed all day on both or one sides of the roadway.

For urban and rural land uses:

Risk Level	Description
Higher	Parking permitted all day on one or both sides of the roadway
Medium	Parking permitted during part of the day on one or both sides of the roadway
Lower	Parking is permitted but rarely if ever actually utilized

N/A (no risk)	Parking is prohibited
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Characteristics of Urban Roads Transportation Association of Canada (TAC), 2009

	CHARACTERISTICS OF URBAN ROADS									
	PUBLIC LANES		LOCALS		COLLECTORS		ARTERIALS		EXPRESSWAYS	FREEWAYS
	RESIDENTIAL	COMMERCIAL	RESIDENTIAL	INDUSTRIAL / COMMERCIAL	RESIDENTIAL	INDUSTRIAL / COMMERCIAL	MINOR	MAJOR		
TRAFFIC SERVICE FUNCTION	traffic movement not a consideration		traffic movement secondary consideration		traffic movement and land access of equal importance		traffic movement major consideration	traffic movement primary consideration	traffic movement primary consideration	optimum mobility
LAND SERVICE / ACCESS	land access only function		land access primary function		traffic movement and land access of equal importance		some access control	right access control	no access	no access
TRAFFIC VOLUME (VEH/DAY) TYPICAL	<500	<1000	<1000	<3000	<8000	1000 - 12 000	5000 - 20 000	10 000 - 30 000	>10 000	> 20 000
FLOW CHARACTERISTICS	interrupted flow		interrupted flow		interrupted flow		uninterrupted flow except at signals and crosswalk		uninterrupted flow except at signals	free-flow (grade separated)
DESIGN SPEED (KM/H)	30 - 40		30 - 50		50 - 80		50 - 70	60 - 100	80 - 110	80 - 120
AVERAGE RUNNING SPEEDS (KM/H) (OFF-PEAK)	20 - 30		20 - 40		30 - 70		40 - 60	50 - 90	60 - 90	70 - 110
VEHICLE TYPE	passenger and service vehicles	all types	passenger and service vehicles	all types	passenger and service vehicles	all types	all types	all types up to 20% trucks	all types up to 20% trucks	all types up to 20% trucks
DESIRABLE CONNECTIONS	public lanes, locals		public lanes, locals, collectors		locals, collectors, arterials		collectors, arterials, expressways, freeways		arterials, expressways, freeways	arterials, expressways, freeways
TRANSIT SERVICE	not permitted		generally avoided		permitted		express and local buses permitted		express buses only	express buses only
ACCOMMODATION OF CYCLISTS	no restrictions or special facilities		no restrictions or special facilities		no restrictions or special facilities		lane widening or separate facilities desirable		prohibited	prohibited
ACCOMMODATION OF PEDESTRIANS	pedestrians permitted, no special facilities		sidewalks normally on one or both sides	sidewalks provided where required	sidewalks provided both sides	sidewalks provided where required	sidewalks, may be provided, separation for traffic lanes preferred		pedestrians prohibited	pedestrians prohibited
PARKING (TYPICALLY)	some restrictions		no restrictions or restrictions one side only		few restrictions other than peak hour		peak hour restrictions	prohibited or peak hour restrictions	prohibited	prohibited
MIN. INTERSECTION SPACING (m)	as needed		60		60		200	400	800	1600 (between interchanges)
RIGHT- OF WAY WIDTH (m) (TYPICALLY)	6 - 10		15 - 22		20 - 24		20 - 45 (20m in width applicable to retrofit conditions only)		>45	>60

Characteristics of Rural Roads
Transportation Association of Canada (TAC), 2009

	CHARACTERISTICS OF RURAL ROADS			
	RURAL LOCALS	RURAL COLLECTORS	RURAL ARTERIALS	RURAL FREEWAYS
SERVICE FUNCTION	traffic movement secondary consideration	traffic movement and land access of equal importance	traffic movement primary consideration	optimum mobility
LAND SERVICE	land access primary consideration	traffic movement and land access of equal importance	land access secondary consideration	no access
TRAFFIC VOLUME VEHICLES PER DAY (TYPICALLY)	< 1000 AADT	< 5000 AADT	< 12 000 AADT	> 8000 AADT
FLOW CHARACTERISTICS	interrupted flow	interrupted flow	uninterrupted flow except at major intersections	freeflow (grade separated) major intersections
DESIGN SPEED (KM/H)	50 - 110	60 - 110	80 - 130	100 - 130
AVERAGE RUNNING SPEED (KM/H) (FREE FLOW CONDITIONS)	50 - 90	50 - 90	60 - 100	70 - 110
VEHICLE TYPE	predominantly passenger cars, light to medium trucks and occasional heavy trucks	all types, up to 30% trucks in the 3 t to 5 t range	all types, up to 20% trucks	all types, up to 20% heavy trucks
NORMAL CONNECTIONS	locals, collectors	locals, collectors, arterials	collectors, arterials, freeways	arterials, freeways

APPENDIX B

Example of Automated Speed Limit Guidelines – Latimer Road



Automated Speed Limit Guidelines FORM A - Automated Speed Limit Guidelines Spreadsheet

Version:
10-Apr-09

Name of Corridor:	Latimer Road		
Segment Evaluated:	Sydenham Road	to	Spooner Road (City Limits)
Geographic Region:			
Road Agency:	City of Kingston		
Road Classification:	Local	Length of Corridor:	840 m
Urban / Rural:	Rural	Design Speed: (Required for Freeway, Expressway, Highway)	
Divided / Undivided:	Undivided	Current Posted Speed: (For information only)	80 km/h
Major / Minor:	Minor	Prevailing Speed: (85th Percentile - for information only)	
# Through Lanes Per Direction:	1 lane	Policy: (Maximum Posted Speed)	

		RISK	Score
A1	GEOMETRY (Horizontal)	Lower	2
A2	GEOMETRY (Vertical)	Lower	2
A3	AVERAGE LANE WIDTH	Lower	1
B	ROADSIDE HAZARDS	Lower	3
C1	PEDESTRIAN EXPOSURE	Higher	3
C2	CYCLIST EXPOSURE	Higher	3
D	PAVEMENT SURFACE	Lower	3
E1	NUMBER OF INTERSECTIONS WITH PUBLIC ROADS	<i>Number of Occurrences</i>	1
	STOP controlled intersection	1	
	Signalized intersection	0	
	Roundabout or traffic circle	0	
	Crosswalk	0	
	Active, at-grade railroad crossing	0	
E2	NUMBER OF INTERSECTIONS WITH PRIVATE ACCESS DRIVEWAYS	<i>Number of Occurrences</i>	0
	Left turn movements permitted	0	
	Right-in / Right-out only	0	
E3	NUMBER OF INTERCHANGES	<i>Number of Occurrences</i>	0
	Number of Interchanges along corridor	0	
F	ON-STREET PARKING	N/A	0

Total Risk Score:

18

Recommended Posted Speed Limit (km/h):

As determined by road characteristics

60

As determined by policy

The recommended posted speed limit may be checked against the prevailing speeds of the roadway and the road's safety performance.

Comments: