TOWN OF COLLINGWOOD

April 25, 2016 **NO....160.. ..-16**

MOVED BY.....Kathy Jeffery.....

SECONDED BY.....(D.M. B. Saunderson)

BE IT RESOLVED:

THAT Staff Report PW2016-07-C, recommending Council adopt the Town of Collingwood Stop Sign Policy dated April 25, 2016 and Town of Collingwood Speed Reduction Policy dated April 25, 2016;

AND THAT Council delegate authority to the Director of Public Works and Engineering to approve or reject requests based on the adopted Stop Sign and Speed Reduction policies.

Staff Report PW2016-07-C re: Adoption of Stop Sign and Speed Reduction Policies

☑ **CARRIED**
☐ **DEFEATED**
☐ **TABLED**

Moved by: _____
Seconded by: _____
Deferred Until: _____

Sandra Cooper
MAYOR

CLERK

☐ ***RECORDED VOTE***

COUNCIL	Yea	Nay
Cooper		
Saunderson		
Fryer		
Edwards		
Ecclestone		
Jeffery		
Doherty		
Madigan		
Lloyd		
TOTAL		

STAFF REPORT

PW2016-07-C

4/25/2016

Submitted to: Mayor, Deputy Mayor and Council

Submitted by: Brian MacDonald, Director of Public Works and Engineering

Subject: Adoption Stop Sign and Speed Reduction Policies

PURPOSE

The purpose of this report is to provide Council with the proper information to adopt Stop Sign and Speed Reduction policies within the Town of Collingwood.

RECOMMENDATION:

THAT Council receive Staff Report PW2016-07 entitled "Adoption of Stop Sign and Speed Reduction Policies"

THAT Council adopt the Town of Collingwood Stop Sign Policy dated April 25, 2016;

THAT Council adopt the Town of Collingwood Speed Reduction Policy dated April 25, 2016;

AND THAT Council delegate authority to the Director of Public Works and Engineering to approve or reject requests based on the adopted Stop Sign and Speed Reduction policies.

1. BACKGROUND

Engineering Services receives numerous requests for stop signs and speed reductions at various intersections and road segments throughout the municipality. These types of requests have traditionally been addressed on an individual basis and decisions brought before council in each instance. Over the past several years, the number of these requests has increased. Engineering Services recommends the implementation of policies that clearly outline procedures, warrants, and staff authority so that these requests can be dealt with fairly and expeditiously.

The installation of stop signs and speed reductions impact a wide range of road users. The safety of drivers, cyclists and pedestrians is an important consideration when determining traffic policy, but should be balanced with the need for the efficient movement of goods and services, such as deliveries, transit schedules, garbage collection, or personal trips.

The two policies included in this report aim to provide a standardized approach when dealing with requests from the public in a fair and effective manner.

2. INPUT FROM OTHER SOURCES

- Ontario Traffic Manual, Book 5 (Ministry of Transportation)
- Transportation Association of Canada
- Reviewed at Department Heads

3. APPLICABLE POLICY OR LEGISLATION

Highway Traffic Act

4. ANALYSIS

Stop Sign Policy

The stop sign policy is based on warrants contained in the Ontario Traffic Manual (OTM), Book 5. The OTM manuals are written by the Ministry of Transportation and are intended to provide guidelines consistent with the intent of the Highway Traffic Act and to provide a basis for road authorities to generate their own guidelines and standards.

When a resident makes a request for a stop sign, staff will follow the procedure contained in the policy as follows:

- Requests are to be submitted to Engineering Services in written format.
- Engineering Services will undertake a survey involving traffic counting and a review of collision history. The need for traffic surveys will be at the discretion of the Director of Engineering and Public Works as they may be deemed unnecessary or already completed.
- The data will be analyzed and the Director of Engineering and Public Works (or designate) will make a decision and inform the individual making the request.
- If the request is approved, the Director shall recommend the passing of the necessary By-Law and have any signage installed.

Speed Reduction Policy

The speed reduction policy is based on warrants from the Transportation Association of Canada (TAC) and standard engineering practices. Speed reductions will be considered if a combination of warrants are met. These include:

- TAC Spreadsheet for Automated Speed Limit Guidelines – this spreadsheet evaluates criteria such as roadway geometry, lane width, roadside hazards,

pedestrian and cyclist exposure, pavement surface, intersections, crosswalks, driveways, and design speeds. The spreadsheet assigns a risk score and calculates an appropriate speed. This speed is then compared with the existing posted speed.

- 85th Percentile Concept – this concept asserts that a speed set at which 85 percent of people drive is considered the maximum safe speed limit for a specific location. Staff will conduct a speed study to determine the 85th Percentile Speed and compare the result to the existing posted speed limit.
- Proximity to a school – roads that abut a school will be given consideration for a reduced speed limit.

The procedure staff is to follow when a request for speed reduction is made is the same as the stop sign request: a written request will be required, staff will conduct the necessary studies (if necessary), and the Director (or designate) will make a decision based on the warrants in the policy.

5. EFFECT ON TOWN FINANCES

N/A

6. APPENDICES & OTHER RESOURCES

Appendix A	Stop Sign Policy (PW-1)
Appendix B	Speed Reduction Policy (PW-2)
Appendix C	TAC Spreadsheet for Automated Speed limit Guidelines

Resource 2	OTM Book 5 http://www.library.mto.gov.on.ca/search.asp?mode=search (search keyword “Ontario Traffic Manual”)

Prepared by:		Department head:
John Velick, P.Eng.		*Brian MacDonald*
Manager, Engineering Services		*Director, Public Works and Engineering*
Town of Collingwood		Town of Collingwood

Appendix A

STOP SIGN INSTALLATION

Applies to: ENGINEERING

Effective date: April 25, 2016

PUBLIC WORKS AND ENGINEERING

POLICY NUMBER: PW-1

Policy Statement

The Town of Collingwood is committed to ensuring the effective and uniform application and operation of traffic control devices to improve safety and convenience for road users, and promote the efficient movement of people and goods.

1. DEFINITIONS

- "Council" means the Council for the Corporation for The Town of Collingwood.
- "Director" means the Director of Public Works and Engineering for the Corporation of the Town of Collingwood or their designate.
- "Ontario Traffic Manual" (OTM) means the Ontario Ministry of Transportation (MTO) design guideline, as current or amended from time to time, comprised of 22 manuals developed to provide guidance for transportation practitioners.
- "Stop Sign" is a regulated traffic sign designated by the Highway Traffic Act to notify motorists to stop before proceeding.

2. PURPOSE

The purpose of this policy is to establish a consistent and standardized process to evaluate requests for the installation of stop signs. The policy is intended to provide a procedure for the approval or denial of stop sign requests.

3. SCOPE

The purpose of the stop sign is to clearly assign right-of-way between vehicles approaching an intersection from different directions when traffic signals are not warranted. The introduction of stop sign control can reduce the frequency of certain types of collision (e.g. right angle or turning), but also results in delay to motorists and may increase some other types of collision (e.g. rear-end). Stop signs should, therefore, not be used indiscriminately.

The appropriate use of stop control is outlined in the Ontario Traffic Manual (OTM), Book 5. The OTM manuals are written by the Ministry of Transportation and are intended to provide guidelines consistent with the intent of the Highway Traffic Act and to provide a basis for road authorities to generate their own guidelines and standards. It is OTM, Book 5 that forms the basis of this Policy.

All-Way stop controls disrupt the flow of traffic and introduce delays to all drivers within the intersection and should only be considered at the intersection of two relatively equal roadways having similar traffic volume demand and operating characteristics. Stop signs are not intended to be used as speed control devices. Their usage should be limited to the control of right-of-way conflicts.

Consideration for the installation of a stop sign will only be considered upon receipt of a written request. Once a request has been received, a stop control will only be considered under the following conditions as stipulated in OTM Book 5:

- At intersections which have experienced a record of collisions of the type which are susceptible to correction by stop control. Stop sign control may be warranted where three or more right angle turning collisions per year have occurred over a period of three years and methods of reducing the collision experience, such as sight line improvements, street lighting, parking prohibitions, enforcement, geometric revisions, or yield sign controls have been tried or considered and found to be inadequate;
- For major roads the total volume on all intersection approaches exceeds 500 vehicles per hour for each of any eight hours of a day and the volume split does not exceed 70/30; or
- For minor roads the total vehicle volume on all intersection approaches exceeds 350 for the highest hour recorded and volume split does not exceed 75/25 for three way control or 65/35 for four way control.

All-way stop controls should not be used under the following conditions:

- Where the protection of pedestrians, school children in particular, is a prime concern. This concern can usually be addressed by other means;
- As a speed control device;
- On roads where progressive signal timing exists;
- On roads within urban areas having a posted speed limit in excess of 60km/h;
- At intersections that are not roundabouts having less than three, or more than four, approaches;
- At intersections that are offset, poorly defined or geometrically substandard;
- On truck or bus routes, except in an industrial area where two such routes cross;
- On multi-lane approaches where a parked or stopped vehicle on the right will obscure the stop sign;
- Where traffic would be required to stop on grades;
- As a means of deterring the movement of through traffic in a residential area;
- Where visibility of the sign is hampered by curves or grades, and insufficient safe stopping distance exists; or
- Where any other traffic device controlling right of way is permanently in place within 250m with the exception of a yield sign.

4. PROCEDURES

- Requests may be made by residents, business operators or any other user of the public roadway.
- Requests shall be submitted to Engineering Services in written format.
- Once the request is received the Engineering department will undertake a survey which will involve traffic counting and a review of collision history. The need for

traffic surveys will be at the discretion of the Director as they may be deemed unnecessary or already completed.

- Once the data has been analyzed, the Director will inform the individual making the request of the outcome.
- If the request is approved, the Director shall recommend the passing of the necessary By-Law to the Development and Operations Services Standing Committee.
- Subsequent to the By-Law being approved by Council, appropriate signage will be installed.

5. GENERAL

The Town of Collingwood Council deems it important to provide and improve public rights of way to ensure the safety of vehicular and pedestrian traffic within the municipality. The implementation of this policy will provide a uniform set of guidelines and procedures that will ensure that any request for stop sign control will be evaluated effectively and efficiently to meet the requirements as set in OTM, Book 5.

Appendix B

Speed Reduction Policy

Applies to: ENGINEERING

Effective date: April 25, 2016

PUBLIC WORKS AND ENGINEERING

POLICY NUMBER: PW-2

Policy Statement
The Town of Collingwood is committed to ensuring the effective and uniform application and operation of speed reduction measures to improve safety and convenience for road users, and promote the efficient movement of people and goods.

1. DEFINITIONS

- "85th Percentile Speed" means the speed at which 85% of all vehicles are observed to be travelling at or below under free flowing conditions.
- "Council" means the Council for the Corporation of the Town of Collingwood.
- "Design Speed" means a speed selected as a basis to establish appropriate geometric design elements for a particular section of road.
- "Director of Public Works" means the Director of Public Works and Engineering for the Corporation of the Town of Collingwood or their designate.
- "Ontario Traffic Manual" (OTM) means the Ontario Ministry of Transportation (MTO) design guideline, as current or amended from time to time, comprised of 22 manuals developed to provide guidance for transportation practitioners.
- "TAC" means the Transportation Association of Canada.

2. PURPOSE

The purpose of this policy is to allow members of the public to request that the Town of Collingwood undertake a review of speed limits on a Town roadway for consideration of reducing the speed limit. Upon receipt of this request, it will be referred to Engineering Services for review in accordance with the procedures outlined in this policy.

3. SCOPE

In adopting this policy, consideration has been given to the following:

- The strongest influence on a driver's selection of travel speed is the physical appearance of the road, which is partly influenced by the design speed selected for that particular road section;
- Setting the posted speed limit at the 85th percentile speed will generally result in a low dispersion in travel speeds in the traffic stream;

- Speed control, aimed at encouraging drivers to travel at an appropriate speed for prevailing conditions, encompasses enforcement, education, and engineering techniques;
- A posted speed limit that is set too low will result in a significant number of "reasonable" drivers operating illegally, place unnecessary burdens on law enforcement personnel, lead to lack of credibility of the posted speed limit, and result in increased tolerance by enforcement agencies;
- Given the functional hierarchy of the municipal road system, posted speed limits should be set in accordance with the function that each road is designed to serve; and
- Arterial and collector roads that accommodate Transit routes should remain at the existing posted speed to maintain scheduling efficiency and timing.

Criteria for Considering a request for Reduced Speed Control

The combination of warrants to reduce speed on a municipal road requires the following:

Warrant "A" AND "B" –TAC Evaluation AND 85th Percentile Speed Study

OR

Warrant "C" – School Abutment

Warrant "A" – TAC Spreadsheet for Automated Speed Limit Guidelines

The TAC spreadsheet is a dynamic table that evaluates multiple road criteria and calculates a Risk Score. This Risk Score is then used to determine a recommended speed limit. Criteria evaluated include:

- Horizontal and vertical geometry
- Lane Width
- Roadside Hazards
- Pedestrian and cyclist exposure
- Pavement Surface
- Intersections
- Crosswalks
- Private Driveways / Access Points
- Parking
- Design Speeds

Town Staff will review the road section and complete the spreadsheet to determine a recommended speed. This will then be compared with the existing posted speed with Warrant "B".

Warrant "B" 85th Percentile Speed Study

A study is performed to determine the speed at which road users are currently travelling. The 85th Percentile Speed is the speed at which 85% of all vehicles are observed to be travelling at or below. A speed set at which 85 percent of people drive is considered the maximum safe

speed limit for a specific location. Most municipalities use the 85th Percentile Speed concept when determining speed limits.

The 85th percentile speed concept is based upon the theory that the majority of drivers:

- Are responsible and prudent
- Do not want to have an accident
- Wish to reach their destination in the shortest possible time

Town Staff will conduct a speed study to determine the 85th Percentile Speed. This will then be compared with the existing posted speed and with Warrant "A".

Warrant "C" School Environments

The Town will consider speed reductions on roads that directly abut schools with a minimum enrollment of 50 pupils. Speed reductions will be considered within 150m of the school.

4. PROCEDURES

- Requests may be made by residents, business operators or any other user of the public roadway.
- Requests shall be submitted to Engineering Services in written format.
- Once the request is received the Engineering department will undertake the studies required for Warrants "A" and "B". The need for traffic surveys will be at the discretion of the Director as they may be deemed unnecessary or already completed.
- Once the data has been analyzed, the Director will inform the individual making the request of the outcome.
- If the request is approved, the Director shall recommend the passing of the necessary By-Law to the Development and Operations Standing Committee.
- Subsequent to the By-Law being approved by Council, appropriate signage will be installed.

5. GENERAL

The Town of Collingwood deems it important to provide and improve public rights of way to ensure the safety of vehicular and pedestrian traffic within the municipality. The implementation of this policy will provide a uniform set of guidelines and procedures that will ensure that any request for a speed reduction will be evaluated effectively.

Furthermore, this policy will also ensure that speed limits are not set artificially or arbitrarily low, which will render a speed reduction ineffective and result in non-compliance by motorists.

Appendix C

Automated Speed Limit Guidelines

FORM A - Automated Speed Limit Guidelines Spreadsheet

Version: 10-Apr-09

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

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

Total Risk Score:

Recommended Posted Speed Limit (km/h):

As determined by road characteristics

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:

Automated Speed Limit Guidelines

FORM B - Site Data Capture Sheet

	Corridor:					
Posted Speed						
Prevailing Speed (observed typical operating speed)						
A1	**GEOMETRY (Horizontal)**					
A2	**GEOMETRY (Vertical)**					
A3	**AVERAGE LANE WIDTH**					
B	**ROADSIDE HAZARDS**					
C1	**PEDESTRIAN EXPOSURE**					
C2	**CYCLIST EXPOSURE**					
D	**PAVEMENT SURFACE**					
E1	**# OF INTERSECTIONS WITH PUBLIC ROADS**	*# of Occurrences*	*# of Occurrences*	*# of Occurrences*	*# of Occurrences*	*# of Occurrences*
	STOP controlled intersection					
	Signalized intersection					
	Roundabout or traffic circle					
	Crosswalk					
	Active, at-grade railroad crossing					
	Sidestreet STOP-controlled or lane					
E2	**# OF INTERSECTIONS WITH PRIVATE ACCESS DRIVEWAYS**	*# of Occurrences*	*# of Occurrences*	*# of Occurrences*	*# of Occurrences*	*# of Occurrences*
	Some Left Allowed					
	Right In / Right Out					
E3	**NUMBER OF INTERCHANGES**					
F	**ON-STREET PARKING**					

A1: GEOMETRY (HORIZONTAL ALIGNMENT)

Risk Description:		
	Higher risk	Fill in land use type: Urban / Rural
	Medium risk	Fill in land use type: Urban / Rural
	Lower risk	Fill in land use type: Urban / Rural

A2: GEOMETRY (VERTICAL ALIGNMENT)

Risk Description:		
	Higher risk	Fill in land use type: Urban / Rural
	Medium risk	Fill in land use type: Urban / Rural
	Lower risk	Fill in land use type: Urban / Rural

An undulating road is considered to have medium risk.

A3: AVERAGE LANE WIDTH

Risk Description:		1 lane per direction	2+ lanes per direction
	Higher risk	Fill in land use type: Urban / Rural	Fill in land use type: Urban / Rural
	Medium risk	Fill in land use type: Urban / Rural	Fill in land use type: Urban / Rural
	Lower risk	Fill in land use type: Urban / Rural	Fill in land use type: Urban / Rural

B: ROADSIDE HAZARDS

Risk Description:		
	Higher risk	Fill in land use type: Urban / Rural
	Medium risk	Fill in land use type: Urban / Rural
	Lower risk	Fill in land use type: Urban / Rural

" Hazards" refer to any non breakaway fixed object or continuous non recoverable risk located within the clear zone as defined by the TAC GDGCR Table 3.1.3.1.
** A continuous roadside or median barrier along a roadway is considered to have medium risk*
Examples of "continuous" hazards: non-recoverable side slopes, rock face, water hazards, row of unprotected trees or utility poles

C1: PEDESTRIAN EXPOSURE (Along the side of the road)

Risk Description:		
	Higher risk	Fill in land use type: Urban / Rural
	Medium risk	Fill in land use type: Urban / Rural
	Lower risk	Fill in land use type: Urban / Rural
	N/A	Fill in land use type: Urban / Rural

For Freeways, Expressways, and Highways only, choose risk level "N/A" when pedestrians are legally prohibited on a roadway

C2: CYCLIST EXPOSURE

Risk Description:		
	Higher risk	Fill in land use type: Urban / Rural
	Medium risk	Fill in land use type: Urban / Rural
	Lower risk	Fill in land use type: Urban / Rural
	N/A	Fill in land use type: Urban / Rural

For Freeways, Expressways, and Highways only, choose risk level "N/A" when cyclists are legally prohibited on a roadway

D: PAVEMENT SURFACE

Risk Description:		
	Higher risk	Fill in land use type: Urban / Rural
	Medium risk	Fill in land use type: Urban / Rural
	Lower risk	Fill in land use type: Urban / Rural

E1: NUMBER OF INTERSECTIONS WITH PUBLIC ROADS

Include intersections at either end of the segment, if applicable.

Traffic control	**Number of Occurrences**
STOP-controlled (All-Way STOP or Two-Way STOP along roadway being evaluated)	
Signalized intersection (full signal or pedestrian signal)	
Roundabout or traffic circle	
Midblock and intersection (where sidestreet STOP-controlled) signed and marked crosswalk that is well-utilized** or special crosswalk	
Active, at-grade railroad crossing	
Sidestreet STOP-controlled (uncontrolled along roadway being evaluated) or lane	

****** well-utilized = more than 10 equivalent adult units per peak hour in a rural area,
and more than 20 equivalent adult units per peak hour in an urban area

Refer to TAC Pedestrian Crossing Control Manual for the calculation of equivalent adult units

E2: NUMBER OF INTERSECTIONS WITH PRIVATE ACCESS DRIVEWAYS

Include private access driveways providing access to active (currently occupied) properties and whether left turn movement is allowed at a driveway . Include access driveways at either end of the segment, if applicable. Count both sides unless the opposing directions of a divided roadway are being evaluated separately.

Driveway	**Number of Occurrences**
Some or all left turn movements permitted	
Right-in-right-out OR right-in only OR right-out only	

E3: NUMBER OF INTERCHANGES

Include interchanges at either end of the segment, if applicable.

Interchange	**Number of Occurrences**
Number of interchanges along corridor	

F: ON-STREET PARKING

Risk Description:		
	Higher risk	Fill in land use type: Urban / Rural
	Medium risk	Fill in land use type: Urban / Rural
	Lower risk	Fill in land use type: Urban / Rural
	N/A	Fill in land use type: Urban / Rural

1) Starting speed value:

Classification	Land Use							
	Rural				Urban			
	Undivided		Divided		Undivided		Divided	
	1 lane per direction	2+ lanes per direction	1 lane per direction	2+ lanes per direction	1 lane per direction	2+ lanes per direction	1 lane per direction	2+ lanes per direction
Freeway	Freeways are typically divided	Freeways are typically divided	A divided freeway typically has 2+ lanes in each direction	Design speed	Freeways are typically divided	Freeways are typically divided	A divided freeway typically has 2+ lanes in each direction	Design speed
Expressway	Design speed	Design speed	Design speed	Design speed	Design speed	Design speed	Design speed	Design speed
Highway	Design speed	Design speed	Design speed	Design speed	Design speed	Design speed	Design speed	Design speed

lane = through lane

divided = a median that separates travel lanes of traffic in opposing directions, which may be flush with, raised above, or depressed below adjacent travel lanes (as per TAC GDGCR Section 2.2.5)

The principle characteristics of "rural" and "urban" roads are described in TAC GDGRC Tables 1.3.4.1 and 1.3.4.2

Notes:

- Starting speed is an ideal desirable operating speed for the classification and land use combination.

Classification		Land Use							
		Rural				Urban			
		Undivided		Divided		Undivided		Divided	
		1 lane per direction	2+ lanes per direction	1 lane per direction	2+ lanes per direction	1 lane per direction	2+ lanes per direction	1 lane per direction	2+ lanes per direction
Arterial	Major	90 km/h	100 km/h	100 km/h	110 km/h	80 km/h		90 km/h	
	Minor	80 km/h	90 km/h	90 km/h	100 km/h	70 km/h		80 km/h	
Collector	Major	70 km/h	80 km/h	80 km/h	90 km/h	70 km/h		80 km/h	
	Minor	60 km/h	70 km/h	70 km/h	80 km/h	60 km/h		70 km/h	
Local		60 km/h				50 km/h			

lane = through lane

divided = a median that separates travel lanes of traffic in opposing directions, which may be flush with, raised above, or depressed below adjacent travel lanes (as per TAC GDGCR Section 2.2.5)

The principle characteristics of "rural" and "urban" roads are described in TAC GDGRC Tables 1.3.4.1 and 1.3.4.2

Notes:

- Starting speed is an ideal desirable operating speed for the classification and land use combination.

2a) FOR RURAL LAND USE: Identify the risk level for each evaluation criteria

A1. Geometry (horizontal alignment)

Classification	Rural		
All	Higher risk	3	More than 6 curves per kilometre
	Medium risk	2	3 to 6 curves per kilometre
	Lower risk	1	Less than 3 curves per kilometre

A2. Geometry (vertical alignment)

Classification	Rural		
All	Higher risk	3	Frequent steep grades (6% or more on 50% of the section or more)
	Medium risk	2	Some steep grades (4% or more on 50% of the section or more)
	Lower risk	1	Generally moderate grades or flat

An undulating road is considered to have medium risk.

A3. Average Lane Width

Classification	Rural		1 lane per direction	2+ lanes per direction
All	Higher risk	3	Available width is narrow compared to typical roadways with the same road classification	Available width is narrow compared to typical roadways with the same road classification
	Medium risk	2	Available width is similar to typical roadways with the same road classification	Available width is similar to typical roadways with the same road classification
	Lower risk	1	Available width is wide compared to typical roadways with the same road classification	Available width is wide compared to typical roadways with the same road classification

Average lane width = available paved surface width per direction, including shoulders and bicycle lanes, divided by the number of auto through lanes

B. Roadside Hazards

Classification	Rural		
All	Higher risk	3	5 or more hazards per kilometre, or continuous hazards on more than 50% of the segment length, on one or both sides
	Medium risk	2	2 to 5 hazards per kilometre, or continuous hazards on 25 to 50% of the segment length, on one or both sides
	Lower risk	1	Less than 2 hazards per kilometre

" Hazards" refer to any non breakaway fixed object or continuous non recoverable risk located within the clear zone as defined by the TAC Geometric Design Guide for Canadian Roads Table 3.1.3.1.

***** A continuous roadside or median barrier along a roadway is considered to have medium risk

Examples of "continuous" hazards: non-recoverable side slopes, rock face, water hazards, row of unprotected trees or utility poles

C1. Pedestrian Exposure (along the side of the road)

Classification	Rural		
All	Higher risk	3	Roadway is used by pedestrians and no pedestrian facilities are provided
	Medium risk	2	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 risk	1	Roadway is used by pedestrians and physically separated pedestrian facilities (sidewalks; trails away from the road) are available; or, roadway has negligible pedestrian demand
Freeways, Expressways, Highways Only	N/A	0	Pedestrians are legally prohibited on the roadway

For Freeways, Expressways, and Highways only, choose risk level "N/A" when pedestrians are legally prohibited on a roadway

C2. Cyclist Exposure

Classification	Rural		
All	Higher risk	3	Roadway is used by cyclists and no road space is allocated to bikes
	Medium risk	2	Roadway is used by cyclists and wide curb lane or shoulder is provided
	Lower risk	1	Roadway is used by cyclists and a designated bike lane is provided; or, roadway is used by cyclist and no road space is allocated to bikes but roadway has very low traffic volumes; or, roadway has negligible cyclist demand
Freeways, Expressways, Highways Only	N/A	0	Cyclists are legally prohibited on the roadway

For Freeways, Expressways, and Highways only, choose risk level "N/A" when cyclists are legally prohibited on a roadway

D. Pavement Surface

Classification	Rural		
All	Higher risk	3	Poor or unpaved / gravel
	Medium risk	2	Fair or rough (significant sections with pot holes, rutting, large cracks, etc)
	Lower risk	1	Good or smooth

E1. Number of Intersections with Public Roads

Classification	Rural
All	Use the evaluation methodology in the TABLES worksheet.

Evaluation methodology is presented in TABLE A.

E2. Number of Intersections with Private Access Driveways

Classification	Rural
All	Use the evaluation methodology in the TABLES worksheet.

Evaluation methodology is presented in TABLE B.

E3. Number of Interchanges

Classification	Rural		
All	Higher risk	3	Interchanges are on average less than 1,000 metres apart
	Medium risk	2	Interchanges are on average 1,000 to 2,000 metres apart
	Lower risk	1	Interchanges are on average more than 2,000 metres apart
	N/A	0	No interchanges

2b) FOR URBAN LAND USE: Identify the risk level for each evaluation criteria

A1. Geometry (horizontal alignment)

Classification	Urban		
All	Higher risk	3	More than 4 curves per kilometre
	Medium risk	2	2 to 4 curves per kilometre
	Lower risk	1	Less than 2 curves per kilometre

A2. Geometry (vertical alignment)

Classification	Urban		
All	Higher risk	3	Frequent steep grades (6% or more on 50% of the section or more)
	Medium risk	2	Some steep grades (4% or more on 50% of the section or more)
	Lower risk	1	Generally moderate grades or flat

An undulating road is considered to have medium risk.

A3. Average Lane Width

Classification	Urban		1 lane per direction	2+ lanes per direction
All	Higher risk	3	Available width is narrow compared to typical roadways with the same road classification	Available width is narrow compared to typical roadways with the same road classification
	Medium risk	2	Available width is similar to typical roadways with the same road classification	Available width is similar to typical roadways with the same road classification
	Lower risk	1	Available width is wide compared to typical roadways with the same road classification	Available width is wide compared to typical roadways with the same road classification

Average lane width = available paved surface width per direction, including shoulders and bicycle lanes, divided by the number of auto through lanes

B. Roadside Hazards

Classification	Urban		
All	Higher risk	3	10 or more hazards per kilometre, or continuous hazards on more than 50% of the segment length, on one or both sides
	Medium risk	2	5 to 9 hazards per kilometre, or continuous hazards on 25 to 50% of the segment length, on one or both sides
	Lower risk	1	Less than 5 hazards per kilometre, any continuous hazards extend for less than 25% of the segment length, or curb and gutter

" Hazards" refer to any non breakaway fixed object or continuous non recoverable risk located within the clear zone as defined by the TAC Geometric Design Guide for Canadian Roads Table 3.1.3.1.

***** A continuous roadside or median barrier along a roadway is considered to have medium risk

Examples of "continuous" hazards: non-recoverable side slopes, rock face, water hazards, row of unprotected trees or utility poles

C1. Pedestrian Exposure (along the side of the road)

Classification	Urban		
All	Higher risk	3	Roadway is used by pedestrians and no pedestrian facilities are provided
	Medium risk	2	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 risk	1	Roadway is used by pedestrians and physically separated pedestrian facilities (sidewalks; trails away from the road) are available; or, roadway has negligible pedestrian demand
Freeways, Expressways, Highways Only	N/A	0	Pedestrians are legally prohibited on the roadway

For Freeways, Expressways, and Highways only, choose risk level "N/A" when pedestrians are legally prohibited on a roadway

C2. Cyclist Exposure

Classification	Urban		
All	Higher risk	3	Roadway is used by cyclists and no road space is allocated to bikes
	Medium risk	2	Roadway is used by cyclists and wide curb lane or shoulder is provided
	Lower risk	1	Roadway is used by cyclists and a designated bike lane is provided; or, roadway is used by cyclist and no road space is allocated to bikes but roadway has very low traffic volumes; or, roadway has negligible cyclist demand
Freeways, Expressways, Highways Only	N/A	0	Cyclists are legally prohibited on the roadway

For Freeways, Expressways, and Highways only, choose risk level "N/A" when cyclists are legally prohibited on a roadway

D. Pavement Surface

Classification	Urban		
All	Higher risk	3	Poor or unpaved / gravel
	Medium risk	2	Fair or rough (significant sections with pot holes, rutting, large cracks, etc)
	Lower risk	1	Good or smooth

E1. Intersection Density (Including midblock crosswalks)

Classification	Urban
All	Use the evaluation methodology in the TABLES worksheet.

Evaluation methodology is presented in TABLE A.

E2. Access Density (Including private driveways, and access to stores and businesses)

Classification	Urban
All	Use the evaluation methodology in the TABLES worksheet.

Evaluation methodology is presented in TABLE B.

E3. Interchange Density

Classification	Urban		
All	Higher risk	3	Interchanges are on average less than 1,000 metres apart
	Medium risk	2	Interchanges are on average 1,000 to 2,000 metres apart
	Lower risk	1	Interchanges are on average more than 2,000 metres apart
	N/A	0	No interchanges

F. On-Street Parking

Classification	Rural		
All	Higher risk	3	Parking permitted all day on one or both sides of the roadway
	Medium risk	2	Parking permitted during part of the day on one or both sides of the roadway
	Lower risk	1	No parking allowed; or parking is permitted but rarely if ever actually utilized
	N/A	0	Parking is legally prohibited

F. On-Street Parking

Classification	Urban		
All	Higher risk	3	Parking permitted all day on one or both sides of the roadway
	Medium risk	2	Parking permitted during part of the day on one or both sides of the roadway
	Lower risk	1	No parking allowed; or parking is permitted but rarely if ever actually utilized
	N/A	0	Parking is legally prohibited

3) Add up the weighted risk scores for the eleven evaluation criteria:

WEIGHTING FACTORS

	Rural	Freeway	Expressway	Highway	Arterial	Collector	Local
	Criteria	WF	WF	WF	WF	WF	WF
A1	Geometry (horizontal alignment)	3	3	3	3	2	2
A2	Geometry (vertical alignment)	3	3	3	3	2	2
A3	Average Lane Width	1	5	5	3	1	1
B	Roadside Hazards	3	4	4	3	3	3
C1	Pedestrian Exposure (along the side of the road)	1	1	1	2	1	1
C2	Cyclist Exposure	1	1	1	3	1	1
D	Pavement Surface	2	2	2	3	3	3
E1	Number of Intersections with Public Roads	n/a	n/a	n/a	n/a	n/a	n/a
E2	Number of Intersections with Private Access Driveways	n/a	n/a	n/a	n/a	n/a	n/a
E3	Number of Interchanges	3	3	3	1	1	1
F	On-Street Parking	1	1	1	1	1	1

Urban	Freeway	Expressway	Highway	Arterial	Collector	Local
Criteria	WF	WF	WF	WF	WF	WF
Geometry (horizontal alignment)	3	3	3	2	1	1
Geometry (vertical alignment)	3	3	3	2	1	1
Average Lane Width	2	2	2	2	2	2
Roadside Hazards	2	2	2	1	1	1
Pedestrian Exposure (along the side of the road)	1	1	1	3	3	3
Cyclist Exposure	1	1	1	3	3	3
Pavement Surface	1	1	1	1	1	1
Number of Intersections with Public Roads	n/a	n/a	n/a	n/a	n/a	n/a
Number of Intersections with Private Access Driveways	n/a	n/a	n/a	n/a	n/a	n/a
Number of Interchanges	3	3	3	1	1	1
On-Street Parking	1	1	1	3	3	3

Rural	Freeway	Expressway	Highway	Arterial	Collector	Local
Max Score	69 + E1	84 + E1	84 + E1	81 + E1	60 + E1	60 + E1
Min Score	12	17	17	20	13	13

Urban	Freeway	Expressway	Highway	Arterial	Collector	Local
Max Score	66 + E1	66 + E1	66 + E1	69 + E1	63 + E1	63 + E1
Min Score	11	11	11	14	12	12

Total Risk Score	

d posted speed limit based on total risk score

Recommended Posted Speed Limit					
130 km/h	120 km/h	110 km/h	100 km/h	90 km/h	80 km/h
26 and lower	27 to 33	34 to 40	41 to 47	48 to 54	55 and higher
120 km/h	110 km/h	100 km/h	90 km/h	80 km/h	70 km/h
26 and lower	27 to 33	34 to 40	41 to 47	48 to 54	55 and higher
110 km/h	100 km/h	90 km/h	80 km/h	70 km/h	
26 and lower	27 to 35	36 to 43	44 to 51	52 and higher	
100 km/h	90 km/h	80 km/h	70 km/h		
26 and lower	27 to 39	40 to 49	50 and higher		
90 km/h	80 km/h	70 km/h			
23 and lower	24 to 39	40 and higher			
80 km/h	70 km/h				
27 and lower	28 and higher				

ended posted speed limit based on total risk score

Recommended Posted Speed Limit					
130 km/h	120 km/h	110 km/h	100 km/h	90 km/h	80 km/h
18 and lower	19 to 20	21 to 40	41 to 47	48 to 54	55 and higher
120 km/h	110 km/h	100 km/h	90 km/h	80 km/h	70 km/h
15 and lower	16 to 20	21 to 29	30 to 34	35 to 40	41 and higher
110 km/h	100 km/h	90 km/h	80 km/h	70 km/h	
20 and lower	21 to 28	29 to 35	36 to 43	44 and higher	
100 km/h	90 km/h	80 km/h	70 km/h		
20 and lower	21 to 39	40 to 49	50 and higher		
90 km/h	80 km/h	70 km/h			
23 and lower	24 to 39	40 and higher			
80 km/h	70 km/h				
27 and lower	28 and higher				

d posted speed limit based on total risk score

Recommended Posted Speed Limit					
130 km/h	120 km/h	110 km/h	100 km/h	90 km/h	80 km/h
26 and lower	27 to 33	34 to 40	41 to 47	48 to 54	55 and higher
120 km/h	110 km/h	100 km/h	90 km/h	80 km/h	70 km/h
15 and lower	16 to 20	21 to 29	30 to 34	35 to 40	41 and higher
110 km/h	100 km/h	90 km/h	80 km/h	70 km/h	
20 and lower	21 to 32	33 to 39	40 to 47	48 and higher	
100 km/h	90 km/h	80 km/h	70 km/h		
26 and lower	27 to 31	32 to 49	50 and higher		
90 km/h	80 km/h	70 km/h			
23 and lower	24 to 39	40 and higher			
80 km/h	70 km/h				
32 and lower	33 and higher				

ended posted speed limit based on total risk score

Recommended Posted Speed Limit					
110 km/h	100 km/h	90 km/h	80 km/h	70 km/h	60 km/h
27 and lower	28 to 33	34 to 41	42 to 50	51 to 61	62 and higher
100 km/h	90 km/h	80 km/h	70 km/h	60 km/h	50 km/h
29 and lower	30 to 37	38 to 45	46 to 53	54 to 61	62 and higher
90 km/h	80 km/h	70 km/h	60 km/h	50 km/h	
29 and lower	30 to 45	46 to 57	58 to 68	69 and higher	
80 km/h	70 km/h	60 km/h	50 km/h		
29 and lower	30 to 37	38 to 50	51 and higher		

nended posted speed limit based on total risk score

Recommended Posted Speed Limit				
90 km/h	80 km/h	70 km/h	60 km/h	50 km/h
29 and lower	30 to 40	41 to 52	53 to 62	63 and higher
80 km/h	70 km/h	60 km/h	50 km/h	
29 and lower	30 to 36	37 to 50	51 and higher	
70 km/h	60 km/h	50 km/h		
33 and lower	34 to 53	54 and higher		
60 km/h	50 km/h	40 km/h		
46 and lower	47 to 57	58 and higher		

ded posted speed limit based on total risk score

Recommended Posted Speed Limit		
60 km/h	50 km/h	40 km/h
46 and lower	47 to 57	58 and higher

scribed in guidelines documen

4a) For URBAN freeways, determine the recommended posted speed limit based on total risk score:

Freeways	Design Speed	Recommended Posted Speed Limit					
		130 km/h	120 km/h	110 km/h	100 km/h	90 km/h	80 km/h
Urban Divided Freeway (2+ lanes)	130 km/h	26 and lower	27 to 33	34 to 40	41 to 47	48 to 54	55 and higher
	120 km/h	120 km/h	110 km/h	100 km/h	90 km/h	80 km/h	70 km/h
		26 and lower	27 to 33	34 to 40	41 to 47	48 to 54	55 and higher
	110 km/h	110 km/h	100 km/h	90 km/h	80 km/h	70 km/h	
		26 and lower	27 to 35	36 to 43	44 to 51	52 and higher	
	100 km/h	100 km/h	90 km/h	80 km/h	70 km/h		
		26 and lower	27 39	40 to 49	50 and higher		
	90 km/h	90 km/h	80 km/h	70 km/h			
		23 and lower	24 to 39	40 and higher			
	80 km/h	80 km/h	70 km/h				
		27 and lower	28 and higher				

4b) For URBAN expressways, determine the recommended posted speed limit based on total risk score:

Expressways	Design Speed	Recommended Posted Speed Limit					
		130 km/h	120 km/h	110 km/h	100 km/h	90 km/h	80 km/h
Urban Divided Expressway (1 lane or 2+ lanes), Urban Undivided Expressway (1 lane or 2+ lanes)	130 km/h	26 and lower	27 to 33	34 to 40	41 to 47	48 to 54	55 and higher
	120 km/h	120 km/h	110 km/h	100 km/h	90 km/h	80 km/h	70 km/h
		26 and lower	27 to 33	34 to 40	41 to 47	48 to 54	55 and higher
	110 km/h	110 km/h	100 km/h	90 km/h	80 km/h	70 km/h	
		26 and lower	27 to 35	36 to 43	44 to 51	52 and higher	
	100 km/h	100 km/h	90 km/h	80 km/h	70 km/h		
		26 and lower	27 to 39	40 to 49	50 and higher		
	90 km/h	90 km/h	80 km/h	70 km/h			
		21 and lower	22 to 39	40 and higher			
	80 km/h	80 km/h	70 km/h				
		25 and lower	26 and higher				

4b) For URBAN Highway, determine the recommended posted speed limit based on total risk score:

Highway	Design Speed	Recommended Posted Speed Limit					
		130 km/h	120 km/h	110 km/h	100 km/h	90 km/h	80 km/h
Urban Divided Highway (1 lane or 2+ lanes), Urban Undivided Highway (1 lane or 2+ lanes)	130 km/h	26 and lower	27 to 33	34 to 40	41 to 47	48 to 54	55 and higher
	120 km/h	120 km/h	110 km/h	100 km/h	90 km/h	80 km/h	70 km/h
		26 and lower	27 to 33	34 to 40	41 to 47	48 to 54	55 and higher
	110 km/h	110 km/h	100 km/h	90 km/h	80 km/h	70 km/h	
		26 and lower	27 to 35	36 to 43	44 to 51	52 and higher	
	100 km/h	100 km/h	90 km/h	80 km/h	70 km/h		
		26 and lower	27 to 39	40 to 49	50 and higher		
	90 km/h	90 km/h	80 km/h	70 km/h			
		21 and lower	22 to 39	40 and higher			
	80 km/h	80 km/h	70 km/h				
		32 and lower	33 and higher				

4c) For URBAN arterial roads, determine the recommended posted speed limit based on total risk score:

Arterials	Starting Speed	Recommended Posted Speed Limit				
		90 km/h	80 km/h	70 km/h	60 km/h	50 km/h
Urban Divided Major Arterial (1 lane or 2+ lanes)	90 km/h	25 and lower	26 to 33	34 to 41	42 to 59	60 and higher
Urban Undivided Major Arterial (1 lane or 2+ lanes)	80 km/h	80 km/h	70 km/h	60 km/h	50 km/h	
Urban Divided Minor Arterial (1 lane or 2+ lanes)		29 and lower	30 to 48	49 to 64	65 and higher	
Urban Undivided Minor Arterial (1 lane or 2+ lanes)	70 km/h	70 km/h	60 km/h	50 km/h		
		33 and lower	34 to 56	57 and higher		

4c) For URBAN collector roads, determine the recommended posted speed limit based on total risk score:

Collectors	Starting Speed	Recommended Posted Speed Limit			
		80 km/h	70 km/h	60 km/h	50 km/h
Urban Divided Major Collector (1 lane or 2+ lanes)	80 km/h	29 and lower	30 to 36	37 to 39	40 and higher
Urban Undivided Major Collector (1 lane or 2+ lane	70 km/h	70 km/h	60 km/h	50 km/h	
Urban Divided Minor Collector (1 lane or 2+ lanes)		33 and lower	34 to 37	38 and higher	
Urban Undivided Minor Collector (1 lane or 2+ lane	60 km/h	60 km/h	50 km/h	40 km/h	
		33 and lower	34 to 50	51 and higher	

4c) For URBAN local roads, determine the recommended posted speed limit based on total risk score:

Locals	Starting Speed	Recommended Posted Speed Limit	
		50 km/h	40 km/h
Urban Undivided or Divided Local (1 lane or 2+ lar	50 km/h	39 and lower	40 and higher

5) Follow speed limit management procedures as described in guidelines document

TABLE A. EVALUATION METHODOLOGY FOR NUMBER OF INTERSECTIONS WITH PUBLIC ROADS

1) Points are assigned based on the traffic control type. Calculate total points based on the number and type oftraffic controls along the segment multiplied by assigned weighting factors. Include intersections at either end of the segment, if applicable.

Traffic Control	# of Occurrences	Corridor Length	Points each	Points
STOP-controlled (All-Way STOP or Two-Way STOP along roadway being evaluated)		÷	x WF	=
Signalized intersection (full signal or pedestrian signal)		÷	x WF	=
Roundabout or traffic circle		÷	x WF	=
Midblock and intersection (where sidestreet STOP-controlled) signed and marked crosswalk that is well-utilized** or special crosswalk		÷	x WF	=
Active, at-grade railroad crossing		÷	x WF	=
Sidestreet STOP-controlled (uncontrolled along roadway being evaluated) or lane		÷	x WF	=
			Total Points:	

** well-utilized = more than 10 equivalent adult units per peak hour in a rural area, and more than 20 equivalent adult units per peak hour in an urban area

Refer to TAC Pedestrian Crossing Control Manual for the calculation of equivalent adult units

Points Each / Weighting Factors

E1: NUMBER OF INTERSECTIONS WITH PUBLIC ROADS

Criteria	Rural						Urban					
	Freeway	Expressway	Highway	Arterial	Collector	Local	Freeway	Expressway	Highway	Arterial	Collector	Local
	WF	WF	WF	WF	WF	WF	WF	WF	WF	WF	WF	WF
STOP controlled intersection	4	4	4	4	4	0.25	4	4	4	4	4	0.25
Signalized intersection	5	5	5	6	3.5	0.75	5	5	5	5	3.5	0.75
Roundabout or traffic circle	2	2	2	2	2	0.75	2	2	2	2	2	0.75
Crosswalk	1	1	1	1	1	0.75	1	1	1	5	1	0.75
Active, at-grade railroad crossing	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Sidestreet STOP-controlled or lane	0.5	0.5	0.5	2	0.5	0.25	0.5	0.5	0.5	0.5	0.5	0.25

After being rounded to the nearest whole number, the total points is equivalent to the NUMBER OF INTERSECTIONS WITH PUBLIC ROADS risk score.

TABLE B. EVALUATION METHODOLOGY FOR NUMBER OF INTERSECTIONS WITH PRIVATE ACCESS DRIVEWAYS

1) Points are assigned based on whether left turn movement is allowed at a driveway providing access to active (currently occupied) properties. Calculate total points based on the number of driveways and whether left turn movement is permitted or not and multiplied by assigned weighting factors. Include accesses at either end of the segment, if applicable.

Left turn movement	# of Occurrences	Corridor Length	Points each	Points
Some or all left turn movements permitted		÷	x WF	=
Right-in-right-out OR right-in only OR right-out only		÷	x WF	=
			Total Points:	

Points Each / Weighting Factors

E2: NUMBER OF INTERSECTIONS WITH PRIVATE ACCESS DRIVEWAYS (cap at 15)

Criteria	Rural						Urban					
	Freeway	Expressway	Highway	Arterial	Collector	Local	Freeway	Expressway	Highway	Arterial	Collector	Local
	WF	WF	WF	WF	WF	WF	WF	WF	WF	WF	WF	WF
Left turn movements permitted	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5
Right-in / Right-out only	0.35	0.35	0.35	0.4	0.35	0.35	0.35	0.35	0.35	1	0.35	0.35

After being rounded to the nearest whole number with a cap at 15, the total points is equivalent to the NUMBER OF INTERSECTIONS WITH PRIVATE ACCESS DRIVEWAYS risk score.