The Corporation of the Town of Tecumseh

POLICY MANUAL

POLICY NUMBER: 32	**EFFECTIVE DATE:** July 14, 2015
SUPERCEDES: RCM 141/99	**APPROVAL:** RCM-232/15 July 14, 2015
SUBJECT: Stop Sign Policy	

PURPOSE:

The purpose of this policy is to outline the steps to determine whether a "Stop" sign or "All-Way Stop" sign is warranted at a particular intersection.

SCOPE:

The following policy governs the rules and regulations in the placement of, and in requesting the placement of, "Stop" signs and "All-Way Stop" signs within the Town of Tecumseh at any particular intersection.

1.0 GUIDELINES FOR THE REQUESTING OF:

1.1 Stop Signs:

Upon the receipt of a telephone or written request for the installation and/or removal of a stop sign, the applicant will be informed that a petition, favourably signed by at least 60% of the residents within three hundred (300) metres of the subject intersection, must be submitted.

Upon receipt of this petition, the Town's Director of Public Works & Environmental Services will inspect the site and in conjunction with the Guidelines/Warrants set

out in Subsection 2.2 of this policy, make a recommendation on the proposed installation.

Should the Director of Public Works & Environmental Services **recommend in favour** of the installation or removal, the matter will be presented to Council.

Should the Director of Public Works & Environmental Services **recommend not in favour** of the installation or removal, the applicant will be contacted in writing of the decision.

Should the applicant wish to appeal the matter, Council will review the matter.

1.2 **All-Way Stop Signs:**

If the request is for the installation and/or removal of an All-Way Stop Sign control, the applicant will be informed that a petition, favourably signed by at least 60% of the residents within three hundred (300) metres of the subject intersection, must be submitted.

Upon receipt of this petition, the Town's Director of Public Works will inspect the site and in conjunction with the Guidelines/Warrants set out in Subsection 1.2.1 of this policy, make a recommendation on the proposed installation.

Should the Director of Public Works recommend in favour of the installation or removal, the matter will be presented to Council.

Should the Director of Public Works recommend not in favour of the installation or removal, the applicant will be contacted in writing of the decision.

Should the applicant wish to appeal the matter, Council will review the matter.

1.2.1 **The All-Way Stop Controlled Warrant**

The warrant analysis is based on the methodologies prescribed by the Ontario Traffic Manual (OTM) Book 5. In order for the warrant to be satisfied the following conditions must be met in one of three ways:

i. Minimum Volume Warrant (Arterial and Major Roads):

An all-way stop control may be considered on major roads when the following conditions are met:

Condition 1: The total vehicle volume on all intersection approaches exceeds 500 vehicles per hour for each of any eight hours of the day.

Condition 2: The combined vehicular and pedestrian volume on the minor street exceeds 200 units per hour (all vehicles plus pedestrians wishing to enter the intersection) for each of the same eight hours, with an average delay to traffic on the minor street (either vehicles or pedestrians wishing to enter the intersection) of greater than 30 seconds.

Condition 3: The volume split does not exceed 70/30. Volume on the major street is defined as vehicles only. Volume on the minor street includes all vehicles plus any pedestrians wishing to cross the major roadway.

In order for this warrant to be satisfied, **ALL** three of the above conditions must be met.

ii. Minimum Volume Warrant (Minor Roads):

An all-way stop control may be considered on minor roads when the following conditions are met:

Condition 1: The total vehicle volume on all intersection approaches exceeds 350 for the highest hour recorded.

Condition 2: The volume split does not exceed 75/25 for three-way control or 65/35 for four-way control. Volume is defined as vehicles only.

iii. Collision Warrant:

The number of collisions which occur at an intersection can also determine the need for an All-Way Stop Control. **BOTH** of the following conditions must be met in order for an All-Way Stop Control to be warranted on the basis of collision data:

Condition 1: For the purposes of this warrant, a high accident frequency is an average of four collisions per year over a three-year period. Only those accidents susceptible to relief through multi-way stop control must be considered (i.e. Right angle and turning type collisions).

Condition 2: Included in this warrant are those locations where visibility problems exists which limit the safe approach speed of less than 15 km/h, thereby creating an unreasonable accident potential. Special advance warning or overhead flashing lights may be necessary to augment the control if vertical or horizontal alignment is a factor.

1.3 Warrants which meet the above criteria will be presented by the Director of Public Works to Council with the recommendation to install/remove a sign at the intersection in question.

1.4 Should the warrant not be met, the Director of Public Works will file the warrant study and advise the applicant in writing of the decision.

1.5 The installation or removal of stop signs shall be subject to the availability of municipal funding and will be completely at the discretion of Council, and allowing for opportunities to coordinate with other construction projects.

2.0 STOP SIGN CONTROL:

2.1 Restrictions:

Stop signs shall not be used as a speed control device. The usage of stop signs shall be limited to the control of right-of-way conflicts.

Stop signs shall only be placed where traffic-engineering studies, which have considered issues such as traffic speeds, traffic volumes, restricted sightlines and traffic accidents, have found that the usage of a stop sign is warranted.

Stop signs shall not be used on the same approach to intersections where traffic control signals are operating.

Portable or part time stop signs shall not be used except in cases of emergency or in temporary situations, such as in conjunction with flag men or at intersections where traffic signals are no longer working.

2.2 Guidelines/Warrants for Installation:

The following are guidelines and warrants for stop sign control at rural or urban intersections within the Town:

1. At the intersection of a town road with a King's Highway.

2. On a minor street or road entering a through street or highway.

3. On the street or road carrying the lesser volume of traffic at an intersection where all streets are of the same functional classification.

4. At un-signalized intersections in a signalized area except where they would interfere with traffic signal progression.

5. At intersections where the right-hand rule would be unduly hazardous.

6. Where three or more right angled collisions per year have occurred and methods of reducing this collision experience such as improving sight lines, street lighting, parking prohibitions, enforcement, geometric revisions, or a yield sign have been tried but found to be unsuccessful.

7. At an intersection where the safe vehicular approach speed is less than 15km/h.

8. At railway crossings, which are scheduled for automatic protection, as an interim measure.

9. Within an intersection with a divided highway where a stop sign is present at the entrance to the first roadway and further controls are necessary at the entrance to the second roadway and where the median width between the two roadways exceeds 30m.

Prior to the application of these warrants, consideration should be given to less restrictive measures such as the Yield sign where a full stop is not necessary at all times. Periodic reviews of existing installations may be desirable to determine whether, because of changing conditions the use of less restrictive control or no control could accommodate traffic demands safely and more effectively.

3.0 ALL-WAY STOP SIGN CONTROL:

3.1 Restrictions

All-way stop signs should only be used when the volume of traffic on the intersecting roads is approximately equal.

All-way stop signs should not be used:

1. Where pedestrian protection is a prime concern. This should be addressed through the use of Pedestrian right of way controls in the form of Pedestrian Crossovers, warning signs, pavement markings, crossing guards, etc.

2. As a speed control device.

3. On roads which progressive signal timing exists.

4. On roadways in urban areas having a posted speed limit in excess of 60km/hr.

5. At intersections having less than three or more than four approaches.

6. At offset of poorly defined intersections.

7. On truck or bus routes unless in an industrial area or where two such routes cross.

8. On multi-lane approaches, where a parked or stopped vehicle on the right may obscure a stop sign.

9. Where traffic would be required to stop on a steep grade.

10. As a means of detouring the movement of through traffic in a residential area.

11. Where visibility of the sign is hampered by curves or grades and a safe stopping distance of less than 100 m exists.

12. Where any other traffic device controlling the right-of-way is permanently in place within 250m (with the exception of a yield sign).

3.2 Guidelines/Warrants for Installation of All-Way Stops:

All-way stop signs can be implemented if one or more of the following is the reason for the installation:

1. As an interim measure where traffic control signals are warranted but cannot be implemented immediately.

2. At a location where the warrant, described in Section 1.2.1 of this policy is met, as per the requirements of the Warrant Analysis.

3. As a means of providing an introductory period to accustom drivers to a reversal of intersection control. Installation under this warrant would be for a period not to exceed 3 months.

4.0 LOCATION OF STOP SIGNS:

The following sets out the guidelines for where the stop sign may be placed at the corner in question:

Where one road intersects another road at an acute angle, the stop sign on the intersecting road should be turned or shielded so that motorists travelling on the higher priority road cannot read it.

Stop signs should be erected at the point where the vehicle is to stop, or as near as possible. It may be supplemented with a stop line if it controls traffic approaching at a major intersection. The stop sign should be placed as close to the near edge of the intersecting roadway as possible and this distance should not exceed 15m unless it is clearly not practical to locate the stop sign closer to the intersection.

5.0 REFERENCE:

For legal references and additional requirements of stop signs, Section 117 (A) (B) of the *Highway Traffic Ac*t and also Regulation 486, Section 7 & 8, Ontario Traffic Manual (OTM) Book 5 and excerpts from MTO's Manual of Uniform Traffic Control Devices shall be referred to.

Instructions

Fill out any yellow coloured cells on the "Warrant" tab.
These are:
- Date and Road Names
- AWSC Average Delay
- Collision Record
- Safe Approach Speed
- Major Street Direction
- "T" Configuration

Fill out the vehicle and pedestrian volumes on the "Data Entry" tab (in appropriate time slot).

To validate formulas you must unlock the sheet. Do this only when necessary to protect the warrant calculations:
- Select the appropriate tab
- Click Tools->Protection->Unprotect Sheet...

TOWN OF TECUMSEH: ALL-WAY STOP CONTROL WARRANT

(Based on OTM Book 5 - March 2000)

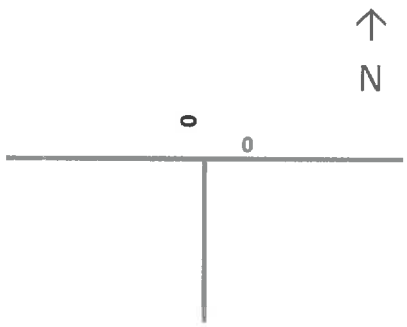
DATE:
MINOR STREET:
MAJOR STREET:

Major Street Direction?
- ○ North / South
- ◉ East / West

Minor Street 'T' Intersection?
- ◉ NB -or- EB
- ○ SB -or- WB
- ○ No 'T'

Time	Vehicular Volumes (vph) NB Approac	SB Approac	EB Approac	WB Approac	TOTAL
					0
					0
					0
					0
					0
					0
					0
					0
8-HOUR TOTAL	*0*	*0*	*0*	*0*	*0*

Pedestrian Crossing Volumes Crossing Major Street	Crossing Minor Street
0	*0*



All-way Stop Minimum Volume Warrant (Arterial and Major Roads)

All-way stop control may be considered on major roads where the following conditions are met:

Condition 1:

The total vehicle volume on all intersection approaches exceeds **500** vehicles per hour for each of any eight hours of the day.

Data Recorded:

Hour 1:	0 vph	**Hour 5:**	0 vph
Hour 2:	0 vph	**Hour 6:**	0 vph
Hour 3:	0 vph	**Hour 7:**	0 vph
Hour 4:	0 vph	**Hour 8:**	0 vph

Warrant Satisfied?

- ☐ YES
- ☑ NO

Condition 2:

The combined vehicular and pedestrian volume on the minor street exceeds **200** units per hour (all vehicles plus pedestrians wishing to enter the intersection) for each of the same eight hours, with an average delay to traffic on the minor street (either vehicles or pedestrians wishing to enter the interesction) of greater than **30**

Data Recorded:

Hour 1:	0 vph	**Hour 5:**	0 vph
Hour 2:	0 vph	**Hour 6:**	0 vph
Hour 3:	0 vph	**Hour 7:**	0 vph
Hour 4:	0 vph	**Hour 8:**	0 vph
Delay:		*Delay as calculated by HCM 2000 method using Synchro 6.*	

Warrant Satisfied?

- ☐ YES
- ☑ NO

Condition 3:

The volume split does not exceed **70/30**. Volume on the major street is defined as vehicles only. Volume on the minor street includes all vehicles plus any pedestrians wishing to cross the major roadway.

Data Recorded:

Total Major Street Volume (veh only):	0	0%
Total Minor Street Volume (veh & ped):	0	0%
Sum:	0	0%

Warrant Satisfied?

- ☑ YES
- ☐ NO

TOWN OF TECUMSEH: ALL-WAY STOP CONTROL WARRANT

(Based on OTM Book 5 - March 2000)

DATE: 0
MINOR STREET: 0
MAJOR STREET: 0

All-way Stop Minimum Volume Warrant (Minor Roads)

All-way stop control may be considered on minor roads where the following conditions are met:

Condition 1:

Total vehicle volume on all intersection approaches exceeds **350** during the peak hour.

Data Recorded:

Hour 1:	0 vph	**Hour 5:**	0 vph
Hour 2:	0 vph	**Hour 6:**	0 vph
Hour 3:	0 vph	**Hour 7:**	0 vph
Hour 4:	0 vph	**Hour 8:**	0 vph

Warrant Satisfied?

- ☐ YES
- ☑ NO

Condition 2:

Volume split does not exceed **75/25** for three-way control or **65/35** for four-way control. Volume is defined as vehicles only.

Data Recorded:

		3-way control
Total Major Street Volume (veh only):	0	0%
Total Minor Street Volume (veh & ped):	0	0%
Sum:	0	0%

Warrant Satisfied?

- ☑ YES
- ☐ NO

All-way Stop Collision Warrant

Condition 1:

For the purposes of this warrant, a high accident frequency is an average of **four** collisions per year over a three-year period. Only those accidents susceptible to relief through multi-way stop control must be considered (i.e., right angle and turning type collisions).

Collision Record:

Year 1:		**Average**
Year 2:		0
Year 3:		
Total:		

Warrant Satisfied?

- ☐ YES
- ☑ NO

Condition 2:

Included in this warrant are those locations where visibility problems exist which limit the safe approach speed to less than **15 km/h**, thereby creating an unreasonable accident potential. Special advance warning or overhead flashing lights may be necessary to augment the control if vertical or horizontal alignment is a factor.

Safe Approach Speeds:

NB:	
SB:	
EB:	
WB:	

Warrant Satisfied?

- ☑ YES
- ☐ NO

TOWN OF TECUSMEH: ALL-WAY STOP CONTROL WARRANT

(Based on OTM Book 5 - March 2000)

DATE: 0
MINOR STREET: 0
MAJOR STREET: 0

Summary of Warrants

All-way Stop Minimum Volume Warrant (Arterial and Major Roads)

Condition 1	No	Overall: No
Condition 2	No	
Condition 3	Yes	

All-way Stop Minimum Volume Warrant (Minor Roads)

Condition 1	No	Overall: No
Condition 2	Yes	

All-way Stop Collision Warrant

Condition 1	No	Overall: No
Condition 2	Yes	

ALL-WAY STOP CONTROL

is

NOT WARRANTED

All-way stop control usage notes:

In some circumstances, it may be appropriate to install STOP signs on all approaches to an intersection. This results in an all-way stop condition. All-way STOP sign 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 (see minimum volume warrants below). The approaches should be directly opposing (i.e., not offset), should preferably approach at right angles (i.e., no skewed approaches) and have an equal number of lanes.

All-way stop controls should be considered only under the following situations:

- As an interim measure, where traffic control signals are warranted but cannot be implemented immediately.
- At locations having a high collision frequency where less restrictive measures have been tried and found inadequate (see all-way stop collision warrant below).
- As a means of providing a transition period to accustom drivers to a change in intersection right of way control from one direction to another. Installation under this warrant must be in conformance with the Amendment of Intersection Control.

Inappropriate Use of All-way Stop 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.
- At intersections that are not roundabouts having less than three, or more than four, approaches.
- 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.
- Where visibility of the sign is hampered by curves or grades, and insufficient safe stopping distance exists.
- Where any other traffic device controlling right of way is permanently in place within 250 m, with the exception of a YIELD sign.
- 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 60 km/h.
- At intersections that are offset, poorly defined or geometrically substandard.
- On truck or bus routes, except in an industrial area or where two such routes cross.
- As a means of deterring the movement of through traffic in a residential area.

	at	Turning Movements												Pedestrian Crossing				Total Vehicles	Hourly Totals
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	NB	SB	EB	WB		
15 Minute Counts	6:00 - 6:15																	0	0
	6:15 - 6:30																	0	0
	6:30 - 6:45																	0	0
	6:45 - 7:00																	0	0
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	19:15 - 19:30																	0	0
	19:30 - 19:45																	0	0
	19:45 - 20:00																	0	0
																	Total Hours Counted:		0

TOWN OF TECUMSEH
STOP SIGN POLICY
SCHEDULE "A"

WARRANT STUDY

The installation of All-Way Stop Sign Controls will be considered at the intersection of two like roadways when any one of the following warrants is completely satisfied.

Location of Study: _____ Performed By: _____

Date: _____ Address: _____

Time: _____ Phone #: _____

WARRANT DESCRIPTION			WARRANT COMPLIENCE YES	NO
1. As an interim measure where traffic control signals are warrented but installation is delayed.				
2. Where 4 accidents per year (for a 3 year period) have occurred which may be susceptible to relief through an All-Way Stop sign control following a trial of less restrictive measures	Accidents	Types		
3. Where the traffic volume split is similar (i.e. where it does not exceed 70/30 for any 8 hours of the day) and either 3 i, ii, iii or iv are satisfied. Use schedule B to collect Traffic Volumes.	Ratio			
i) Where the total vehicle volume entering the intersection on all approaches exceeds 500 vehicles during the peak hour.	Vehicles Entering			
ii) Where the combined vehicular and pedestrian volume on the minor street exceeds 200 units during the peak hour.	Vehicles and Pedestrians			
iii) Where an average delay to traffic is greater than 30 seconds during the peak hour. Use Schedule C to determine Time of Delay.	Time of Delay			
iv) On local roads where the total vehicle volume entering the intersection on all approaches exceeds 350 vehicles during the peak hour.	Vehicles Entering			
4. As an interim measure at intersections where regulatory controls are being reversed for a maximum of 3 months.				

Approval for an All- Way Stop Sign Control will normally be denied under the following conditions:

1) Where pedestrian protection is a prime concern as this should be addressed by other means.
2) As a speed control device.
3) On roadways with progressive signal timings.
4) On roadways within an urban area having a posted speed limit in excess of 60 km/h.
5) At intersections with less than 3 or more than 4 approaches or at offset intersections.
6) On truck or bus routes unless in an industrial area where 2 routes cross.
7) On multi-lane approaches where stopped/parked vehicles might obscure the Stop Sign.
8) Where traffic would be required to stop on steep grades.
9) As a means of detouring the movement of through traffic in a residential area.
10) Where visibility conditions restricts the safe stopping distance to less than 100 metres.
11) Where any other permanent traffic control device is within 250 m (with the exception of a yield sign.

I certify that the above information accurately reflects my observations at the time this study was performed.

Signature	Date	Witness	Date

TOWN OF TECUMSEH
STOP SIGN POLICY
SCHEDULE "B"

INTERSECTION TRAFFIC COUNT SUMMARY

This schedule shall be used to record traffic counts at the subject intersection when Warrant No. 3 of Schedule "A" is being considered. The study shall be done during a period of peak traffic flow and for a minimum time length of 1 hour. It should preferably be carried out on a Tuesday, Wednesday or Thursday. Peak a.m. traffic will usually occur between 7:00 and 9:00 a.m. while peak p.m. traffic time will usually occur between 4:00 and 6:00 p.m.

Location of Study: _____	Performed By: _____
Day/Date: _____	Address: _____
Time Period: _____	Weather: _____

TOWN OF TECUMSEH
STOP SIGN POLICY
SCHEDULE "C"
INTERSECTION DELAY STUDY

This schedule shall be used to determine the Average Delay to traffic when Warrant No. 3 iii) is being considered. The study shall be done during a period of peak traffic flow and for a time period of 10 minutes. It should preferably be carried out on Tuesday, Wednesday, or Thursday. Peak a.m. traffic will usually occur between 7:00 and 9:00 a.m. while peak p.m. traffic will usually occur between 4:00 and 6:00 p.m. The number of stopped vehicles (or vehicles which are queued and are moving slowly forward toward the intersection) shall be counted along the approach being studied every 15 seconds. This number shall be placed in the applicable box. The number of vehicles along the same approach, which are able to enter the intersection, shall also be counted and placed in the applicable box. Refer to the example for additional assistance.

Location of Study: _____ Performed By: _____

Day/Date: _____ Address: _____

Time Period: _____ Weather: _____

_____

# of stopped vehicles along approach being studied

ELAPSED TIME

ACTUAL TIME		+00 sec.	+ 15 sec.	+ 30 sec.	+45 sec.	No. of vehicles along approach which were able to enter the intersection
	0 minutes					
	1 minute					
	2 minutes					
	3 minutes					
	4 minutes					
	5 minutes					
	6 minutes					
	7 minutes					
	8 minutes					
	9 minutes					
	10 minutes					
	TOTALS					
		A	B	C	D	E

AVERAGE DELAY= $\frac{[A+B+C+D] \times 15}{E}$

$= \frac{[\quad\quad] \times 15}{[\quad]}$

= _____ seconds

TOWN OF TECUMSEH
STOP SIGN POLICY
SCHEDULE "D"
INTERSECTION DELAY STUDY EXAMPLE

		# of stopped vehicles along approach being studied ELAPSED TIME				
ACTUAL TIME		+00 sec.	+ 15 sec.	+ 30 sec.	+45 sec.	No. of vehicles along approach which were able to enter the intersection
4:15	0 minutes	9	10	8	0	6
4:16	1 minute	5	6	4	2	3
4:17	2 minutes	3	5	6	2	4
4:18	3 minutes	4	2	2	0	4
4:19	4 minutes	2	4	3	1	5
4:20	5 minutes	6	8	5	4	6
4:21	6 minutes	1	8	4	5	2
4:22	7 minutes	4	5	1	2	2
4:23	8 minutes	2	9	5	0	4
4:24	9 minutes	2	3	8	3	5
4:25	10 minutes	5	4	0	6	6
	TOTALS	43	64	46	25	47
		A	B	C	D	E

AVERAGE DELAY= $\frac{[A+B+C+D] \times 15}{E}$

$= \frac{[43+64+46+25] \times 15}{47}$

= 56.8 seconds