

APPENDIX 6

TRAFFIC SIGNAL WARRANTS ANALYSES

**MINIMUM WARRANTS FOR INSTALLATION OF TRAFFIC SIGNAL
USING PROJECTED VOLUME**

Location JOLIVALE ROAD
(Roadway)

at SLACKLEAF DRIVE
(Intersecting Road)

Municipality CITY OF OTTAWA

Projected Volume FUTURE (2013) BACKGROUND
TRAFFIC - PM PEAK HOUR

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS		COMPLIANCE			
		2. FREE FLOW	3. RESTRICT. FLOW	SECTIONAL		4. ENTIRE %	
				Number	%		
1. VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	720 864	1369	158	54	[641 + 561 + 167] = 1369
	B. Vehicle volume along minor roads (average Hour)	120	170 285 306	167	54		167
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	720 864	1202	139	139	[641 + 561] = 1202
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (average Hour)	50	75 90	132	147		132

NOTES:

- Vehicle volume warrants (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above.
- Warrant values for free flow apply when the 85 percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000.
- Warrant values for restricted flow apply to large urban communities when the 85 percentile speed of artery traffic does not exceed 70 km/h.
- The lowest sectional percentage governs the entire warrant.
- For "T" intersections the warrant values for minor road should be increased by 50% (Warrant 1B only)
- The crossing volumes are defined as:
 - Left turns from both minor road approaches 132
 - The heaviest through volume from the minor road x
 - 50% of the heavier left turn movement from major road when both of the following are met:
 - the left turn volume > 120 vhp x
 - the left turn volume plus the opposing volume > 720 vph x
 - Pedestrians crossing the major road.

CONCLUSION: TRAFFIC SIGNALS ARE WARRANTED.

**MINIMUM WARRANTS FOR INSTALLATION OF TRAFFIC SIGNAL
USING PROJECTED VOLUME**

Location JOCKVALE ROAD
(Roadway)

at BLAKELEAF DRIVE
(Intersecting Road)

Municipality CITY OF OTTAWA

Projected Volume FUTURE (2013) BACKWARD
TRAFFIC - AM PEAK HOUR

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS		COMPLIANCE		
		2. FREE FLOW	3. RESTRICT. FLOW	SECTIONAL		4. ENTIRE %
				Number	%	
1. VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	720 864	1007	116	89
	B. Vehicle volume along minor roads (average Hour)	120	170 306	273	89	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	720 864	734	85	85
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (average Hour)	50	75 90	214	237	

$[410 + 324 + 273] = 1007$

273

$[410 + 324] = 734$

214

NOTES:

- Vehicle volume warrants (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above.
- Warrant values for free flow apply when the 85 percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000.
- Warrant values for restricted flow apply to large urban communities when the 85 percentile speed of artery traffic does not exceed 70 km/h.
- The lowest sectional percentage governs the entire warrant.
- For "T" intersections the warrant values for minor road should be increased by 50% (Warrant 1B only)
- The crossing volumes are defined as:
 - Left turns from both minor road approaches 214
 - The heaviest through volume from the minor road x
 - 50% of the heavier left turn movement from major road when both of the following are met:
 - the left turn volume > 120 vhp x
 - the left turn volume plus the opposing volume > 720 vhp x
 - Pedestrians crossing the major road.

CONCLUSION: TRAFFIC SIGNALS ARE WARRANTED.

**MINIMUM WARRANTS FOR INSTALLATION OF TRAFFIC SIGNAL
USING PROJECTED VOLUME**

Location SOLEVALE ROAD
(Roadway)

at RIVERSTONE DRIVE
(Intersecting Road)

Municipality CITY OF OTTAWA

Projected Volume FUTURE (2013) BACK-CROWD TRAFFIC - AM PEAK HOUR

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS		COMPLIANCE		
		2. FREE FLOW	3. RESTRICT. FLOW	SECTIONAL		4. ENTIRE %
				Number	%	
1. VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	720 864	1426	165	64
	B. Vehicle volume along minor roads (average Hour)	120	170 204	130	64	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	720 864	1296	150	48
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (average Hour)	50	75 90	43	48	

[881 + 415 + 100 + 30] = 1426
[100 + 30] = 130
[881 + 415] = 1296
[25 + 18] = 43

NOTES:

- Vehicle volume warrants (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above.
- Warrant values for free flow apply when the 85 percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000.
- Warrant values for restricted flow apply to large urban communities when the 85 percentile speed of artery traffic does not exceed 70 km/h.
- The lowest sectional percentage governs the entire warrant.
- For "T" intersections the warrant values for minor road should be increased by 50% (Warrant 1B only)
- The crossing volumes are defined as:
 - Left turns from both minor road approaches $25 + 18$
 - The heaviest through volume from the minor road \times
 - 50% of the heavier left turn movement from major road when both of the following are met:
 - the left turn volume > 120 vhp \times
 - the left turn volume plus the opposing volume > 720 vph \times
 - Pedestrians crossing the major road.

**MINIMUM WARRANTS FOR INSTALLATION OF TRAFFIC SIGNAL
USING PROJECTED VOLUME**

Location LOCKVALE ROAD
(Roadway)

at RIVERSTONE DRIVE
(Intersecting Road)

Municipality CITY OF OTTAWA

Projected Volume FUTURE (2013) BACKGROUND
TRAFFIC - PM PEAK HOUR

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS		COMPLIANCE		
		2. FREE FLOW	3. RESTRICT. FLOW	SECTIONAL		4. ENTIRE %
				Number	%	
1. VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	$\frac{720}{864}$	1988	230	50
	B. Vehicle volume along minor roads (average Hour)	120	$\frac{170}{204}$	103	50	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	$\frac{720}{864}$	1885	218	130
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (average Hour)	50	$\frac{75}{90}$	117	130	

$[17+86+787+1098]=1988$
 $[17+86]=103$
 $[787+1098]=1885$
 $[24+15+78]=117$

NOTES:

- Vehicle volume warrants (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above.
- Warrant values for free flow apply when the 85 percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000.
- Warrant values for restricted flow apply to large urban communities when the 85 percentile speed of artery traffic does not exceed 70 km/h.
- The lowest sectional percentage governs the entire warrant.
- For "T" intersections the warrant values for minor road should be increased by 50% (Warrant 1B only)
- The crossing volumes are defined as:
 - Left turns from both minor road approaches $24+15$
 - The heaviest through volume from the minor road \times
 - 50% of the heavier left turn movement from major road when both of the following are met:
 - the left turn volume > 120 vhp $\checkmark 155$
 - the left turn volume plus the opposing volume > 720 vhp \checkmark
 - Pedestrians crossing the major road.

$\left. \begin{array}{l} \text{(i)} \\ \text{(ii)} \end{array} \right\} \frac{155}{2} = 78$

CONCLUSION: TRAFFIC SIGNALS ARE WARRANTED.