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TECHNICAL MEMORANDUM

SUBJECT: Warrants for Traffic Control Devices

This memorandum describes the different warrants used in the Woodstock TMP study, the basis for each one, and the results and limitations experienced during analysis of the warrants.

The following table lists the warrants used, the description of each warrant, and the location each warrant is referenced from.

Table 1 – Warrants

Intersections		Description	Reference
1	Traffic Signal Warrant	Provides justification for the installation of general traffic signals. Based upon total volume and turning movement counts as well as pedestrian movement and collision history.	Ontario Traffic Manual Book 12 (2007) – Section 4, pages 69-105
2	Left Turn Phasing Warrant	Provides justification for the alteration of phasing to include a separate left turn phase. Based upon current timings, total volume, turning movement counts and intersection geometry.	Ontario Traffic Manual Book 12 (2007) – Section 3.5, pages 34-36
3	Intersection Pedestrian Signal (IPS) Warrant	Provides justification for the installation of intersection pedestrian signals. Based upon pedestrian movements, collision history, vehicle operating speed and intersection geometry.	Signal Warrants for Region of Waterloo (City of Hamilton and MTO)
4	All-Way Stop Warrant	Provides justification for the installation of all-way stops. Based upon total intersection volumes and directional split.	Ontario Traffic Manual Book 5 (2000) – Section 2, pages 19-21

Note: The warrant for IPS is included at the end of this Appendix. Reference - Region of Waterloo Report: E-03-049, File Code: C06-60, T08-40/GEN

For the traffic signal warrants, eight hour counts are required to complete an analysis. To make the analysis more complete, detailed collision data is required (in order to judge preventability) as well as pedestrian counts. During the course of the study, only three hour counts and limited pedestrian data was available for the unsignalized intersections, making justification of signal warrants difficult. The available data was factored to arrive at 8 hour counts for these locations; however, it is not best practice to rely on this data. It is recommended that instead of taking action based upon these warrants, the following locations should continue to be monitored:

- Vansittart Ave at Dundas St
- Main St at Wellington St
- Nellis St at Clarke St

For left turn phasing, questions were raised by members of the public regarding appropriateness of implementing designated left turn phasing at certain intersections. A left turn phasing warrant analysis was completed for each intersection in question and resulted in no new left turn phasing being justified.

For the IPS Warrants, 8 hour pedestrian counts were completed during the school year, highlighting the peak pedestrian traffic throughout the day. These counts included the total number of pedestrians crossing both roadways. However, IPS warrant calculations also call for the total to be separated according to unassisted and assisted (younger school children, the elderly, and those with walking disabilities), as well as the average delay (in seconds) experienced by the average pedestrian crossing the main roadway. Since these were not included in the counts, values had to be estimated. To estimate the numbers of assisted pedestrians, school peak hours were observed and the numbers corresponding gave an approximate indication of the amount of school children total throughout the day. It was assumed that approximately 35-40% of all pedestrians were assisted. To estimate delay, existing signal timing plans and traffic was reviewed. Delay times were estimated based upon speed of cars, probability of cars grouping together and the distance between groups of cars based upon adjacent signal timings. The IPS signal warrant analysis used this data, and based on the warrants, the following intersections may warrant an IPS, in order of priority:

- Springbank Ave and Sprucedale Rd
- Dundas St and York St
- Devonshire Ave and Brompton Ave
- Huron St near the Salvation Army Store* (Should be implemented as a mid-block signal)

Although the following intersection may meet the warrants, it is just at the threshold for acceptance. Since it is based upon estimated values, it is recommended that a full review should be conducted.

- Clarke St and Sloane St

For the All-Way Stop Warrant, the only intersection review was at Springbank Ave and Lansdowne Ave. The constraint with this warrant was that initially there was no traffic count data and was reviewed based upon AADT values. This initial analysis indicated that an all-way stop would be warranted at this location. After this, traffic count data was made available and the same results were found indicating that an all-way stop was still warranted.

The following pages give the analysis results as they relate to the different warrants.

Left Turn Phasing Justification

$L_{TV} > C_{LT}$ for left turn phasing justification
L_{TV} = Left turning vehicles during peak hour
$C_{Lt} = 1400 * G/C – (f) V_o + L_{ta}$
(f) = Variable based upon opposing number of lanes
V_o = Opposing Volume
L_{ta} = Left turns on amber (7200 / C)
G = Green Time, C = Cycle Length

Is Left Turn Phasing Justified at the Intersection of Wellington and Dundas?
→ **No left turn phasing is justified.**
C = 80, G = 35, L_{ta} = 90, f = 1.0

Northbound (AM → V_o = 136, L_{TV} = 33) (PM → V_o = 220, L_{TV} = 34)
(AM) $C_{LT} = [1400 * (35/80)] – [1 * 136] + 90 = 566.5$
Since 33 < 566.5 left turn phasing is not justified
(PM) C_{LT} = 482.5
Since 34 < 482.5 left turn phasing is not justified
Southbound (AM → V_o = 194, L_{TV} = 68) (PM → V_o = 256, L_{TV} = 97)
(AM) C_{LT} = 508.5
Since 68 < 508.5 left turn phasing is not justified
(PM) C_{LT} = 446.5
Since 97 < 446.5 left turn phasing is not justified
Eastbound (AM → V_o = 299, L_{TV} = 17) (PM → V_o = 403, L_{TV} = 34)
(AM) C_{LT} = 403
Since 17 < 403 left turn phasing is not justified
(PM) C_{LT} = 299.5
Since 34 < 299.5 left turn phasing is not justified
Westbound (AM → V_o = 291, L_{TV} = 20) (PM → V_o = 353, L_{TV} = 25)
(AM) C_{LT} = 411.5
Since 20 < 411.5 left turn phasing is not justified
(PM) C_{LT} = 349.5
Since 25 < 349.5 left turn phasing is not justified

Is Left Turn Phasing Justified at the Intersection of Dundas and Mill?
→ **No left turn phasing is justified.**
C = 80, G = 39, L_{ta} = 90, f = .625 (two opposing lanes of traffic)

Westbound
AM → V_o = 472, L_{TV} = 139
C_{LT} = 477.5
Since 139 < 477.5 left turn phasing is not justified
PM → V_o = 474, L_{TV} = 185
C_{LT} = 476.25
Since 185 < 476.25 left turn phasing is not justified

Intersection: Devonshire & Blossom Park

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	Yes
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	Yes

6) Tests A, B, C, D.

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume	77
Assisted Pedestrian Volume and Seniors	46
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)	92
Total Adjusted Pedestrian Volume	169
Average Delay in Seconds	16.5
Average Delay * Adjusted Pedestrian Volume	2788.5
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay	52.80624963
Priority Points	***53***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)	0.5
15 Priority Points Per Average Collision	
Priority Points	***7.5***

**(9 Accidents over 9 years, assume 50% are preventable)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)	570
Priority Points	***20.0***

Test D) Vehicle Operating Speed

Operating Speed (km/h)	60
Priority Points	***5***
TOTAL PRIORITY POINTS	***85.5***
Is IPS Warranted?	***IPS is Warranted***

Intersection: Devonshire & Valleyview

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	Yes
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	Yes

6) Tests A, B, C, D.

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume	66
Assisted Pedestrian Volume and Seniors	39
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)	78
Total Adjusted Pedestrian Volume	144
Average Delay in Seconds	22
Average Delay * Adjusted Pedestrian Volume	3168
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay	56.28498912
Priority Points	***56***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)	0.111111111
15 Priority Points Per Average Collision	
Priority Points	***1.67***

**(2 Collisions over 9 years…Assumed 50% of these are preventable)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)	265
Priority Points	***8.95***

Test D) Vehicle Operating Speed

Operating Speed (km/h)	60
Priority Points	***5***
TOTAL PRIORITY POINTS	***71.62***
Is IPS Warranted?	***Not Warranted***

Intersection: Clarke & Sloane

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	Yes
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	Yes

6) Tests A, B, C, D.

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume	62
Assisted Pedestrian Volume and Seniors	38
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)	76
Total Adjusted Pedestrian Volume	138
Average Delay in Seconds	13
Average Delay * Adjusted Pedestrian Volume	1794
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay	42.35563717
Priority Points	***42***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)	0.8888888
15 Priority Points Per Average Collision	
Priority Points	***13.3***

**(16 Collisions over 9 years, assume 50% are preventable)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)	360
Priority Points	***20***

Test D) Vehicle Operating Speed

Operating Speed (km/h)	60
Priority Points	***5***
TOTAL PRIORITY POINTS	***80.333332***
Is IPS Warranted?	***IPS is Warranted***

Intersection: Clarke & Warwick

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	**No**
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	Yes
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	Yes

6) Tests A, B, C, D.

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume	64
Assisted Pedestrian Volume and Seniors	38
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)	76
Total Adjusted Pedestrian Volume	140
Average Delay in Seconds	10.5
Average Delay * Adjusted Pedestrian Volume	1470
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay	38.34057903
Priority Points	***38***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)	0.166666667
15 Priority Points Per Average Collision	
Priority Points	***2.5***

**(3 Collisions over 9 years, assume 50% are preventable)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)	475
Priority Points	***20***

Test D) Vehicle Operating Speed

Operating Speed (km/h)	55
Priority Points	***2.5***
TOTAL PRIORITY POINTS	***63***
Is IPS Warranted?	***Not Warranted***

Intersection: Dundas & York

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	Yes
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	No, but yes after change to transit station
6) Tests A, B, C, D.	

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume	69
Assisted Pedestrian Volume and Seniors	41
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)	82
Total Adjusted Pedestrian Volume	151
Average Delay in Seconds	26
Average Delay * Adjusted Pedestrian Volume	3926
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay	62.65780079
Priority Points	***63***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)	1.27777778
15 Priority Points Per Average Collision	
Priority Points	***19.17***

**(23 Collisions over 9 years, assume 50% are preventable)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)	220
Priority Points	***1***

Test D) Vehicle Operating Speed

Operating Speed (km/h)	55
Priority Points	***2.5***
TOTAL PRIORITY POINTS	***85.67***
Is IPS Warranted?	***IPS is Warranted***

Intersection: Alice & Aileen

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	Yes
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	Yes

6) Tests A, B, C, D.

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume		71
Assisted Pedestrian Volume and Seniors		43
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)		86
Total Adjusted Pedestrian Volume		157
Average Delay in Seconds		8.5
Average Delay * Adjusted Pedestrian Volume		1334.5
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay		36.53080892
	Priority Points	***37***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)		0
15 Priority Points Per Average Collision		
	Priority Points	***0***

**(0 Collisions over 9 years)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)		500
	Priority Points	***20***

Test D) Vehicle Operating Speed

Operating Speed (km/h)		50
	Priority Points	***0***
	TOTAL PRIORITY POINTS	***57***
	Is IPS Warranted?	***Not Warranted***

Intersection: Sprucedale & Springbank

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	Yes
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	Yes

6) Tests A, B, C, D.

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume	88
Assisted Pedestrian Volume and Seniors	53
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)	106
Total Adjusted Pedestrian Volume	194
Average Delay in Seconds	30
Average Delay * Adjusted Pedestrian Volume	5820
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay	76.28892449
Priority Points	***76***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)	0.166666667
15 Priority Points Per Average Collision	
Priority Points	***2.5***

**(3 Collisions over 9 years, assume 50% are preventable)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)	535
Priority Points	***20***

Test D) Vehicle Operating Speed

Operating Speed (km/h)	65
Priority Points	***7.5***

TOTAL PRIORITY POINTS	***106***
Is IPS Warranted?	***IPS is Warranted***

Intersection: Huron @ Salvation Army Store

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	Yes
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	No Sidestreet

6) Tests A, B, C, D.

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume	104
Assisted Pedestrian Volume and Seniors	62
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)	124
Total Adjusted Pedestrian Volume	228
Average Delay in Seconds	20
Average Delay * Adjusted Pedestrian Volume	4560
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay	67.52777206
Priority Points	***68***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)	0
15 Priority Points Per Average Collision	
Priority Points	***0***

**(0 Known Collisions over 9 years)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)	260
Priority Points	***8.3***

Test D) Vehicle Operating Speed

Operating Speed (km/h)	65
Priority Points	***7.5***
TOTAL PRIORITY POINTS	***83.8***
Is IPS Warranted?	***IPS is Warranted***

Intersection: Fifth & Mill

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	**No**
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	Yes

6) Tests A, B, C, D.

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume	0
Assisted Pedestrian Volume and Seniors	25
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)	50
Total Adjusted Pedestrian Volume	50
Average Delay in Seconds	30
Average Delay * Adjusted Pedestrian Volume	1500
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay	38.72983346
Priority Points	***39***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)	0.388888
15 Priority Points Per Average Collision	
Priority Points	***5.83***

**(7 Collisions over 9 years, assume 75% are preventable)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)	440
Priority Points	***20***

Test D) Vehicle Operating Speed

Operating Speed (km/h)	65
Priority Points	***7.5***
TOTAL PRIORITY POINTS	***72.33***
Is IPS Warranted?	***Not Warranted***

Intersection: Springbank & Lansdowne

1) IPS to be installed farther than 215 metres from closest traffic control signal or stop sign.	Yes
2) IPS to be installed on a roadway with a posted speed under 60 km/hr	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Minimum of 100 pedestrians crossing the main street during the seven highest hours of the day	**Yes**
5) Fewer than 5,000 vehicles per day on the intersecting side street approaches	Yes

6) Tests A, B, C, D.

Test A) Combined Pedestrian Volume and Delay

Non Assisted Pedestrian Volume		65
Assisted Pedestrian Volume and Seniors		39
Assisted Pedestrian Volume and Seniors * Adjustment Factor (2)		78
Total Adjusted Pedestrian Volume		143
Average Delay in Seconds		8.5
Average Delay * Adjusted Pedestrian Volume		1215.5
Square Root of the Adjusted Pedestrian Volume and Pedestrian Delay		34.86402157
	Priority Points	***35***

Test B) Average Number of Preventable Collisions in a 10 Year Period

Average number of collisions (#)		0.111111111
15 Priority Points Per Average Collision		
	Priority Points	***1.67***

**(2 Collisions over 9 years, assume 50% are preventable)

Test C) Distance to Nearest Protected Pedestrian Crossing

Distance (metres)		910
	Priority Points	***20***

Test D) Vehicle Operating Speed

Operating Speed (km/h)		65
	Priority Points	***7.5***
	TOTAL PRIORITY POINTS	***64.17***
	Is IPS Warranted?	***Not Warranted***

Intersection: Springbank & Lansdowne (Justification for All-Way Stop)

1) Vehicle volume exceeds 350 for highest hour?	Yes
2) Volume split does not exceed 65/35 for four-way stop	Yes
3) Adequate sight distance available for pedestrians and vehicles	Yes
4) Speed limit is below 60 km/h	Yes
5) All other traffic controlling devices are further than 250 m from intersection	Yes

WARRANT SPECIFICATIONS

Arterial / Major Roads
Total volume on all approaches exceeds 500 veh/hour for each of any eight hours of the day
Combined vehicular and pedestrian volumes on the minor street exceeds 200 units per hour for each of the same eight hours
Average delay to traffic on minor street exceeds 30 seconds
Volume split does not exceed 70/30

OR

Minor Roads
Total vehicle volume on all intersection approaches exceeds 350 for the highest hour
Volume split does not exceed 65/35 for four-way control

OR

Four or more preventable collisions per year over a three-year period

Intersection/Midblock Pedestrian Signal Warrant Criteria

The following criteria must be met before applying the warrant calculation for the installation of IPS:

1. IPS should not be installed closer than 215 metres to another traffic control signal or stop sign on a two-way street or closer than 125 metres to another traffic control signal or stop sign on a one-way street.

2. IPS should not be installed on roadways with a posted speed in excess of 60 km/hr.

3. Adequate sight distance must be available for both pedestrians and vehicles for the operating speed of the roadway.

4. A minimum of 100 pedestrians must be present crossing the main street during the seven highest hours of the day.

5. Fewer than 5,000 vehicles per day must be present on the intersecting side street approaches. (This does not apply to the midblock signal warrant).

6. In order for IPS to be warranted the sum of the priority points for Test A, B, C and D must be greater than 80.

Test A	Combined Pedestrian Volume and Delay, see reference section
Test B	Average Number of Preventable Collisions in a 10-Year Period, see reference section
Test C	Distance to Nearest Protected Pedestrian Crossing, see reference section
Test D	Vehicle Operating Speed, see reference section

REFERENCE:

Test A - Combined Pedestrian Volume and Delay

This test establishes the priority points for the combined pedestrian volume and delay. The number of priority points is the square root of the product of the following:

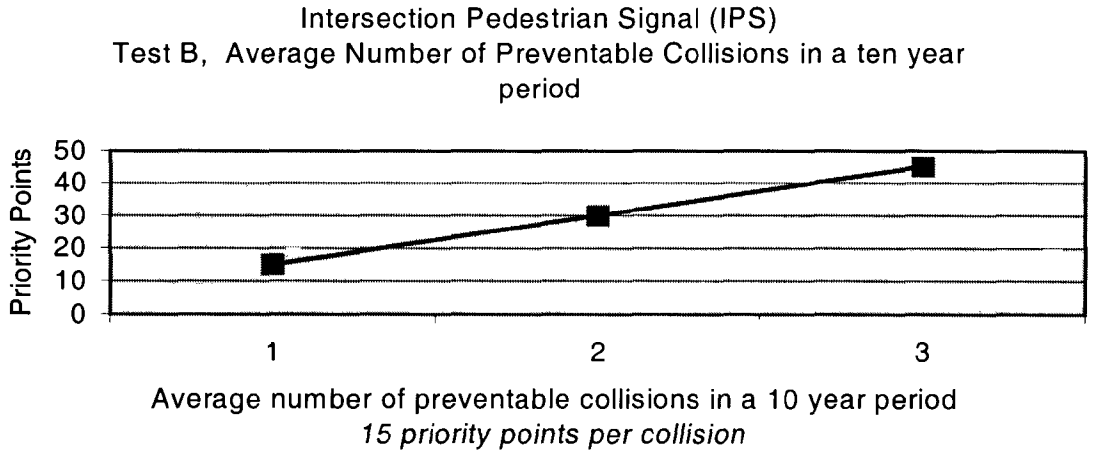
- The adjusted pedestrian volume during a seven-hour period, multiplied by an adjustment factor. The adjustment factor of 2 is used for assisted pedestrians, children under the age of 12 and Seniors, and
- The average delay pedestrians encounter while waiting to cross the roadway in seconds.

Test A Sample Calculation

Priority Points Criteria			Units
Non assisted pedestrian volume and adults	100	=	100
Assisted pedestrian volume and seniors x adjustment factor	100 x 2	=	200
Total adjusted pedestrian volume			300
Average delay in seconds			35.6 sec
Average delay x adjusted pedestrian volume	35.6 x 300	=	10,680
Square Root of the adjusted pedestrian volume and pedestrian delay	10,680	=	103.3
Priority Points		=	103

Test B - Average Number of Preventable Collisions in a Ten-Year Period

This test establishes the priority points for the number of preventable pedestrian related collisions crossing the major street in a 10 year period at the proposed IPS location.

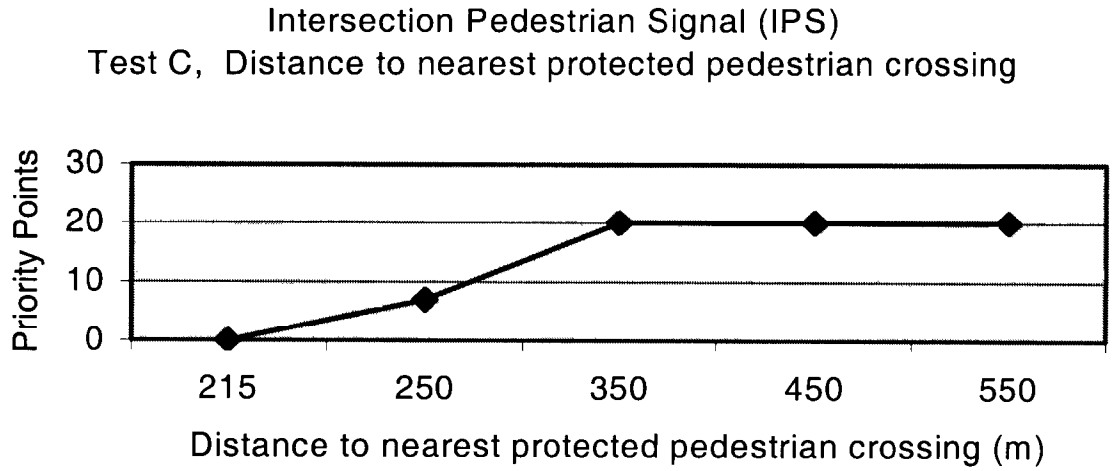


Example

- Average number of preventable collisions in a 10-year period of 1 equals 15 priority points.

Test C - Distance to Nearest Protected Pedestrian Crossing

This test establishes the priority points for the proposed location in relationship to the proximity of the nearest protected pedestrian crossing facility. As the distance from a protected pedestrian crossing increases, the more suitable an IPS location becomes.

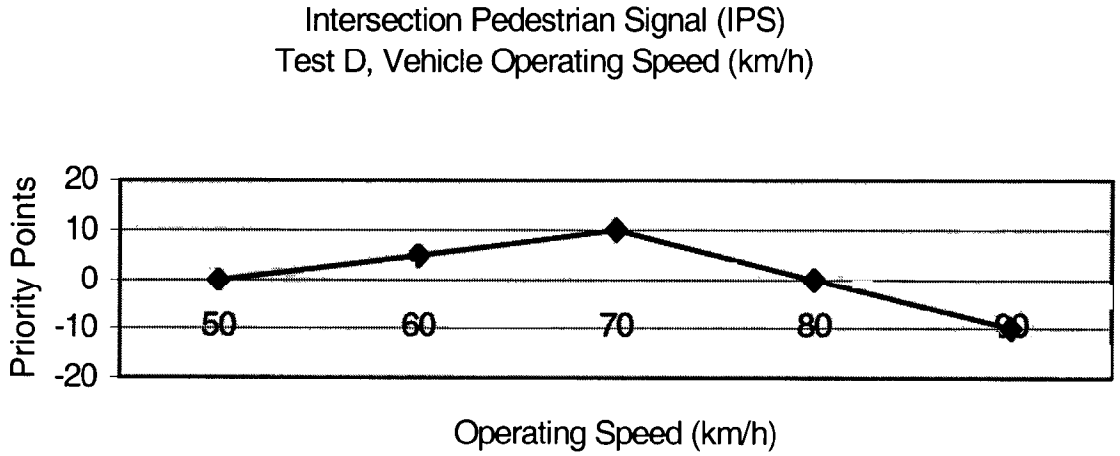


Example

- 350 metres from the proposed location to the nearest protected crossing equals 20 priority points.

Test D - Vehicle Operating Speed

This test establishes the priority points for the operating speed of the road. As the operating speed increases the less suitable an IPS location becomes.



Example

- 90 km/h vehicle operating speed equals –10 priority points.

Summary

	Test	Priority Points
A	Combined pedestrian volume and delay	103
B	Average number of preventable collisions in a 10-year period	15
C	Distance to nearest protected pedestrian crossing	20
D	Vehicle operating speed	- 10
	Total	128
	Warranted (Greater than 80)	Yes